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TECHNICAL REPORT

Evaluation of S190A Radiometric

Exposure Test Data

(NASA-CR-140387) EVALUATION OF S190A

N75-14098

RADIOMETRIC EXPOSURE TEST DATA

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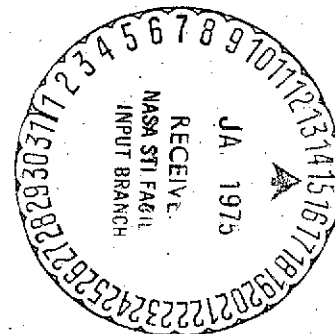
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Technicolor Graphic Services, Inc.

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Exposure Test Data

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## SECTION I

### Introduction

The SL90A preflight radiometric exposure test data generated at Kennedy Space Center as part of preflight and system test of KM-002 Sequence 29 on flight camera S/N 002 was analyzed.

The purpose of the analysis was to determine camera system transmission using available data which included:

- ° Films exposed to a calibrated light source subject.
- ° Filter transmission data.
- ° Calibrated light source data.
- ° Density vs.  $\log_{10}$  Exposure curves for the films.
- ° Spectral sensitometric data for the films.

This report outlines the procedure used, includes the data and a transmission matrix as a function of field position for nine measured points on each station-film-filter-aperture-shutter speed combination.

## SECTION II

### Procedure

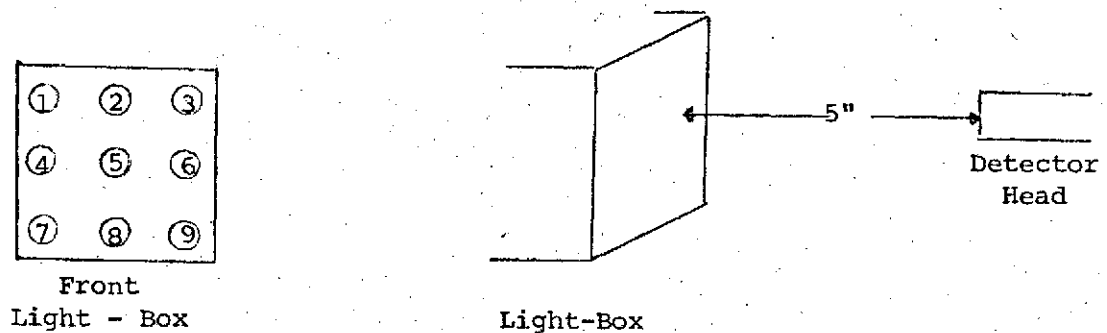
The Photographic Technology Division (PTD) received six rolls of film and a series of documents, as follows, from which S190A camera system transmission was to be determined.

- Itek system resolution report
- Spectral radiometric calibration of S190A light source
- Evaluation of KM-002 film
- Sensor Performance Report, MSC #05526

The procedure was as follows:

A. Organize Spectral Radiometric and Photometric Data

The calibration data of the S190A light source was reviewed and correlated with the imagery. Data included measurements recorded in watts/cm<sup>2</sup>/10nm units taken from the source at 9 positions as drawn:



Front

FIGURE 1

Light Measurement Orientation

It was assumed that each camera frame recorded this array, and nine density measurements in the image should correlate with the nine light box positions.

The data from each station-film-filter-aperture-shutter speed combination was correlated to determine the parameters used for each image exposure.

Reviewing the S190A light source data raised some questions.

- ° The report suggests that to convert radiometer meter readings to watts/cm<sup>2</sup>/10nm one should multiply by the spectral response of the radiometer in amps/watt. It is believed that division rather than multiplication will give the correct result.
- ° There is some doubt regarding the model number 580-11A listed for the radiometer IR detector head. It may be 580-23A.
- ° The physical dimensions of the light box and the test layout are described in insufficient detail to accurately determine box position versus image position. The assumption shown above in Figure 1 was made for data recorded and calculated here.
- ° The configuration of the EG&G radiometer used to measure the calibrated light source was not specified. The angular acceptance of the

instrument is required to calculate illumination from source angular radiance in watts per  $\text{cm}^2$ -steradian-nm. It was deduced from the equipment list that the radiometer was used by placing the filter holder against the lightbox and neither field limiting cone nor other attachments were used. An acceptance angle of  $51^\circ$  was derived by measuring the EG&G radiometer maintained by PTD.

B. Inspect and Read Imagery

Each of the six rolls of S190A imagery was examined and its frames were correlated with summary sheets showing the order of exposure.

Some questions in correlation did arise because extra exposures were made on some of the rolls and notations were absent in the summary sheets. Using densitometry as a guide these questions were resolved.

Visual density of each black-and-white image and red-green-blue densities of each color image were measured on the MacBeth TD-217 densitometer with a 2 mm aperture.

The film was oriented on the densitometer emulsion- up and readings were as shown in Figure 2.



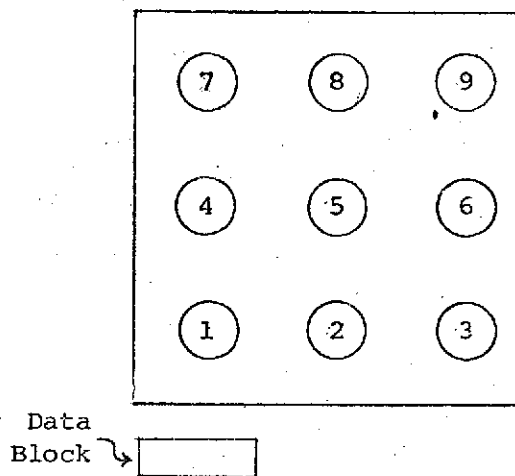


FIGURE 2

# FILM ORIENTATION FOR READING



## C. Calculate Camera System Transmission

The normal method, film density values and D-log E data, was used to determine the camera system transmission,  $T_{cs}$ , by the formula

$$T_{cs} = \frac{4 f^2 E 10^{-7} f d \lambda}{t f N_{\lambda} F_{\lambda} d_{\lambda}}$$

f = camera aperture

E = exposure to produce film density measured from D-log E curves

N = subject brightness

t = camera shutter open time

F = filter transmission

Because the D-log E curves were derived using filters in the sensitometer (Table 1 ) which were simulations, not reproductions, of only some of the S190A camera filters this method was not feasible for all the data, therefore, an alternate method was used to determine  $T_{cs}$ .

TABLE 1

Camera vs. Sensitometer Filters

Station	Film	S190A Filter	Sensitometer Filter
1	2424	CC	5500°K + 89B
2	2424	DD	5500°K + 89B
3	2443	EE	5500°K + W12*
4	SO-356	FF	5500°K*
5	SO-022	BB	5500°K + 25A*
5	SO-022	JJ	5500°K + 25A
6	SO-022	AA	5500°K + 25A
7	SO-022	GG+MM	5500°K + 25A

\* Reasonable Simulation

Camera system transmission was calculated by determining the exposure to be expected on the film using Van Kreveld's<sup>2,4</sup> Law and available exposure data as follows:

The camera exposure equation is

$$E = It$$

where

E = exposure

I = irradiance at the image plane

t = time of exposure

Irradiance at the image plane for a perfect lens<sup>4</sup> is

$$I = \frac{\pi N_o}{4f^2}$$

where

$N_o$  = apparent object radiance

$f$  = camera aperture

Exposure is the reciprocal of film sensitivity,

$$E = \frac{1}{S}$$

Since  $E = I \cdot t$ , this becomes

$$E = \frac{1}{S} = \frac{t \pi N_o}{4 f^2}$$

Apparent object radiance,  $N_o$ , is the actual object radiance,  $N$ , reduced by the camera filter transmission,  $F$ , and lens transmission,  $T$ , at any wavelength,  $\lambda$ , to give

$$N_o = N_{\lambda} T_{\lambda} F_{\lambda}$$

By substitution,

$$\frac{1}{S_{\lambda}} = \frac{t \pi N_{\lambda} T_{\lambda} F_{\lambda}}{4 f^2}$$

therefore, the lens transmission for any wavelength,  $T_{\lambda}$ , is

$$T_{\lambda} = \frac{4 f^2}{t \pi S_{\lambda} N_{\lambda} F_{\lambda}}$$

The camera system transmission,  $T_{cs}$ , for a series of wavelengths requires the integration of  $T_{\lambda}$ , for each wavelength interval,  $d_{\lambda}$ .

$$T_{cs} = \frac{4f^2}{t\pi \int S_{\lambda} N_{\lambda} F_{\lambda} d_{\lambda}}$$

This formula applies in general. This specific case required the following factors:

- To convert ergs/cm<sup>2</sup> to watt sec/cm<sup>2</sup> = 10<sup>7</sup>
- To correct radiometric acceptance angle of 51°;  $\pi \sin^2 \phi = 1.88$
- To correct for image density Log E vs. spectral sensitometric density Log E =  $\frac{E_m}{E_s}$
- To correct for gamma differences for each S<sub>λ</sub> density = K

#### Exposure Correction Factor

Spectral sensitometric data, Appendix B, is determined at a limited series of discrete densities therefore a correction for actual image density was necessary. This was done by determining the exposure factor required to produce the difference between spectral sensitometric and camera densities as measured on the film-filter D-log E data, Appendix A.

#### Gamma Correction Factor

A comparison of the spectral sensitometric data and the film-filter D-log E curves shows a discrepancy in gamma.

The differences in log E required to produce the densities used for determining spectral sensitivity are not proportional to the differences in log E required to produce the same densities on the D-log E curve. They should be proportional by  $E = \frac{1}{S}$ . For example, with 2424 film-filter D-log E data, a log E factor of 0.11 is required to increase density from 1.0 to 1.2, but a log spectral sensitivity (S<sub>λ</sub>) increase of 0.135 is necessary to produce the same change in density.

Curves were derived for each film type using  $\log S_\lambda$  differences on the  $\log E$  axis. In all cases,  $\log S_\lambda$  differences were greater than  $\log E$  differences required to produce equal densities resulting in lower gamma. With SO-022 film, the 25A filter data derived using sensitometer exposure could be used to calculate the gamma correction curve because it correlated with the S190 camera filter BB. For other films the relationship of the sensitometric and spectral sensitometric curves could only be estimated. These curves, included in Appendix B, were used to determine a correction  $\log E$  factor for each  $S_\lambda$  reference density shown in Table . These factors,  $K$ , were applied to the formula resulting in:

$$T_{cs} = \frac{E_m K 7.52 f^2}{E_s 10^7 t \pi \int S_\lambda N_\lambda F_\lambda d_\lambda}$$

This formula was applied to all data except SO-022 film with a BB filter.

TABLE  
GAMMA CORRECTION FACTORS

2424 Film	
Density	Factor
0.4	0.955
0.6	0.850
0.8	0.813
1.0	0.759
1.2	0.724
1.4	0.617
1.6	0.617
1.8	0.562
2.0	0.537

SO-022 Film	
Density	Factor
0.4	1.387
0.6	1.318
0.8	1.070
1.0	1.070
1.2	0.983
1.4	0.955
1.6	0.933
1.8	0.895
2.0	0.851

SO-356 Film	
Density	Factor
<u>Red Layer</u>	
1.0	1.047
1.5	1.122

<u>Green Layer</u>	
1.0	1.096
1.5	1.202

<u>Blue Layer</u>	
1.0	1.148
1.5	1.585

2443 Film	
Density	Factor
<u>Red Layer</u>	
1.0	1.047
1.5	1.096
2.0	1.259

<u>Green Layer</u>	
1.0	1.096
1.5	1.230
2.0	1.622

<u>Blue Layer</u>	
1.0	1.072
1.5	1.202
2.0	1.380

$T_{cs}$  for the remaining eight density points in each transmission matrix was calculated using relative log E data.

#### Transmission Using Sensitometric Exposure Data

Because the BB and 25A filters are essentially the same, it was valid to calculate transmission in one case, SO-022 with a BB filter, using the D-log E curve for a 25A filter and SO-022 film to determine exposure then solving

$$T_{cs} = \frac{4f^2 E 10^{-7} \int d_{\lambda}}{t \int N_{\lambda} F_{\lambda} d_{\lambda}}$$

where

E = exposing energy from Density versus Log E curve at measured density, D

f = camera aperture

t = camera shutter speed

N = effective light source

F = filter transmission

The results of these calculations were used to determine the location of the gamma correction curve relative to the D-log E for SO-022. The gamma correction factors derived from this curve were then applied to SO-022 film with the JJ, MM + GG, and AA filters.

The results of calculations using this formula are shown in the SO-022 film-BB filter data.

### SECTION III

#### Results

Tabulated in this section are the results as measured and calculated for nine in-frame locations for each film-filter-aperture-shutter speed.

#### A. Transmission Matrix with Exposure Data

The camera system transmission calculated for each station-film-filter-shutter speed are included on the following pages.

<u>Station</u>	<u>Film</u>	<u>Filter</u>	<u>Page</u>
1	2424	CC	13
2	2424	DD	22
3	2443	EE	31
4	SO-356	FF	58
5	SO-022	JJ	85
5	SO-022	BB	94
6	SO-022	GG + MM	103
6	SO-022	AA	109



STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 9.5  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2586 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.33}{2.24} = 1.23 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{834.9}{812} \text{ @ center position}$$

$$D = 2.03$$

$$T_{\text{CS}} = 0.515$$

$$D = 2.06$$

$$T_{\text{CS}} = 0.534$$

$$D = 2.04$$

$$T_{\text{CS}} = 0.521$$

$$D = 2.06$$

$$T_{\text{CS}} = 0.534$$

$$D = 2.08$$

$$T_{\text{CS}} = 0.548$$

$$D = 2.07$$

$$T_{\text{CS}} = 0.542$$

$$D = 2.05$$

$$T_{\text{CS}} = 0.528$$

$$D = 2.06$$

$$T_{\text{CS}} = 0.534$$

$$D = 2.05$$

$$T_{\text{CS}} = 0.528$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 9.5  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3920 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.04}{2.10} = 0.87 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{591.11}{615.44} \text{ @ center position}$$

$$D = 1.64$$

$$T_{\text{cs}} = 0.483$$

$$D = 1.67$$

$$T_{\text{cs}} = 0.501$$

$$D = 1.65$$

$$T_{\text{cs}} = 0.489$$

$$D = 1.69$$

$$T_{\text{cs}} = 0.514$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.54$$

$$D = 1.72$$

$$T_{\text{cs}} = 0.533$$

$$D = 1.68$$

$$T_{\text{cs}} = 0.507$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.54$$

$$D = 1.69$$

$$T_{\text{cs}} = 0.514$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 9.5  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1017 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.78}{1.77} = 1.023 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{694.5}{798.35} \text{ @ center position}$$

$$D = 1.17$$

$$T_{cs} = 0.584$$

$$D = 1.17$$

$$T_{cs} = 0.584$$

$$D = 1.11$$

$$T_{cs} = 0.804$$

$$D = 1.23$$

$$T_{cs} = 0.629$$

$$D = 1.23$$

$$T_{cs} = 0.629$$

$$D = 1.17$$

$$T_{cs} = 0.584$$

$$D = 1.18$$

$$T_{cs} = 0.592$$

$$D = 1.19$$

$$T_{cs} = 0.599$$

$$D = 1.14$$

$$T_{cs} = 0.563$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 13.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3920 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.09}{2.10} = .977 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1241.95}{1230.88} \text{ @ center position}$$

$$D = 1.74$$

$$T_{\text{cs}} = 0.533$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.527$$

$$D = 1.68$$

$$T_{\text{cs}} = 0.495$$

$$D = 1.79$$

$$T_{\text{cs}} = 0.566$$

$$D = 1.79$$

$$T_{\text{cs}} = 0.566$$

$$D = 1.75$$

$$T_{\text{cs}} = 0.54$$

$$D = 1.76$$

$$T_{\text{cs}} = 0.546$$

$$D = 1.78$$

$$T_{\text{cs}} = 0.56$$

$$D = 1.72$$

$$T_{\text{cs}} = 0.52$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 13.0  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1017 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.81}{1.77} = 1.096 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1393.5}{1596.7} \text{ @ center position}$$

$$D = 1.16$$

$$T_{\text{cs}} = 0.557$$

$$D = 1.20$$

$$T_{\text{cs}} = 0.585$$

$$D = 1.16$$

$$T_{\text{cs}} = 0.557$$

$$D = 1.23$$

$$T_{\text{cs}} = 0.607$$

$$D = 1.26$$

$$T_{\text{cs}} = 0.63$$

$$D = 1.24$$

$$T_{\text{cs}} = 0.614$$

$$D = 1.20$$

$$T_{\text{cs}} = 0.585$$

$$D = 1.24$$

$$T_{\text{cs}} = 0.614$$

$$D = 1.20$$

$$T_{\text{cs}} = 0.585$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 13.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2009 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.51}{1.55} = 0.912 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1159.06}{1577.06} \text{@ center position}$$

$$D = 0.63$$

$$T_{\text{cs}} = 0.51$$

$$D = 0.68$$

$$T_{\text{cs}} = 0.541$$

$$D = 0.68$$

$$T_{\text{cs}} = 0.541$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.549$$

$$D = 0.76$$

$$T_{\text{cs}} = 0.598$$

$$D = 0.76$$

$$T_{\text{cs}} = 0.598$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.535$$

$$D = 0.72$$

$$T_{\text{cs}} = 0.569$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.549$$

STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 16.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.5467 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.00}{1.97} = 1.07 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{2059.87}{1716.6} \text{ @ center position}$$

D = 1.51	D = 1.56	D = 1.44
T <sub>cs</sub> = 0.624	T <sub>cs</sub> = 0.663	T <sub>cs</sub> = 0.573

D = 1.59	D = 1.65	D = 1.50
T <sub>cs</sub> = 0.688	T <sub>cs</sub> = 0.74	T <sub>cs</sub> = 0.616

D = 1.52	D = 1.58	D = 1.45
T <sub>cs</sub> = 0.631	T <sub>cs</sub> = 0.679	T <sub>cs</sub> = 0.579

STATION 1APERTURE 16.0FILTER CCSHUTTER 0.005FILM 2424

$$\int w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1412 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.66}{1.68} = 0.955$$

@ center position

$$T_{cs} = \frac{4 f^2}{t \pi 10^7} \frac{1.88}{f w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}}, \quad \frac{E_m}{E_s} = \frac{1838.5}{2216.8}$$

@ center position

D = 0.89

T<sub>cs</sub> = 0.597

D = 0.88

T<sub>cs</sub> = 0.594

D = 0.85

T<sub>cs</sub> = 0.59

D = 0.97

T<sub>cs</sub> = 0.626

D = 0.98

T<sub>cs</sub> = 0.629

D = 0.93

T<sub>cs</sub> = 0.612

D = 0.92

T<sub>cs</sub> = 0.608

D = 0.94

T<sub>cs</sub> = 0.616

D = 0.90

T<sub>cs</sub> = 0.601



STATION 1  
 FILTER CC  
 FILM 2424

APERTURE 16.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2924 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.24}{1.40} = 0.69 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1331.8}{2295.34} \text{ @ center position}$$

D =	0.42	D =	0.46	D =	0.56
T <sub>CS</sub> =	0.521	T <sub>CS</sub> =	0.547	T <sub>CS</sub> =	0.619

D =	0.57	D =	0.47	D =	0.66
T <sub>CS</sub> =	0.626	T <sub>CS</sub> =	0.554	T <sub>CS</sub> =	0.699

D =	0.45	D =	0.52	D =	0.49
T <sub>CS</sub> =	0.541	T <sub>CS</sub> =	0.589	T <sub>CS</sub> =	0.567

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 8.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1914 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.64}{2.24} = 2.5 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1208.9}{600.99} \text{ @ center position}$$

$$D = 2.23$$

$$T_{cs} = 1.053$$

$$D = 2.24$$

$$T_{cs} = 1.069$$

$$D = 2.23$$

$$T_{cs} = 1.053$$

$$D = 2.25$$

$$T_{cs} = 1.08$$

$$D = 2.25$$

$$T_{cs} = 1.08$$

$$D = 2.24$$

$$T_{cs} = 1.069$$

$$D = 2.23$$

$$T_{cs} = 1.053$$

$$D = 2.24$$

$$T_{cs} = 1.069$$

$$D = 2.22$$

$$T_{cs} = 1.04$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 8.0  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1914 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.24}{2.24} = 1.0 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{481.28}{300.49} \text{ @ center position}$$

$$D = 1.98$$

$$T_{\text{cs}} = 0.827$$

$$D = 2.00$$

$$T_{\text{cs}} = 0.849$$

$$D = 2.00$$

$$T_{\text{cs}} = 0.849$$

$$D = 2.00$$

$$T_{\text{cs}} = 0.849$$

$$D = 2.01$$

$$T_{\text{cs}} = 0.859$$

$$D = 2.00$$

$$T_{\text{cs}} = 0.849$$

$$D = 1.98$$

$$T_{\text{cs}} = 0.827$$

$$D = 1.99$$

$$T_{\text{cs}} = 0.838$$

$$D = 1.98$$

$$T_{\text{cs}} = 0.827$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 8.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.4675 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.96}{1.97} = 0.977 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{470.32}{366.99} \text{ @ center position}$$

$$D = 1.51$$

$$T_{\text{cs}} = 0.716$$

$$D = 1.54$$

$$T_{\text{cs}} = 0.74$$

$$D = 1.51$$

$$T_{\text{cs}} = 0.716$$

$$D = 1.56$$

$$T_{\text{cs}} = 0.759$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.79$$

$$D = 1.55$$

$$T_{\text{cs}} = 0.753$$

$$D = 1.51$$

$$T_{\text{cs}} = 0.716$$

$$D = 1.56$$

$$T_{\text{cs}} = 0.759$$

$$D = 1.53$$

$$T_{\text{cs}} = 0.734$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 11.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1914 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.32}{2.24} = 1.20 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1091.9}{600.99} \text{ @ center position}$$

$$D = 2.03$$

$$T_{cs} = 0.929$$

$$D = 2.05$$

$$T_{cs} = 0.956$$

$$D = 2.04$$

$$T_{cs} = 0.94$$

$$D = 2.06$$

$$T_{cs} = 0.967$$

$$D = 2.07$$

$$T_{cs} = 0.977$$

$$D = 2.05$$

$$T_{cs} = 0.956$$

$$D = 2.03$$

$$T_{cs} = 0.929$$

$$D = 2.05$$

$$T_{cs} = 0.956$$

$$D = 2.02$$

$$T_{cs} = 0.918$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 11.0  
 SHUTTER 0.005

$$\left\{ W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.4675 \times 10^{-2} \right.$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.98}{1.97} = 1.02 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{928.11}{733.98} \text{ @ center position}$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.747$$

$$D = 1.62$$

$$T_{\text{cs}} = 0.765$$

$$D = 1.58$$

$$T_{\text{cs}} = 0.734$$

$$D = 1.65$$

$$T_{\text{cs}} = 0.795$$

$$D = 1.63$$

$$T_{\text{cs}} = 0.777$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.759$$

$$D = 1.62$$

$$T_{\text{cs}} = 0.765$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.759$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.74$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 11.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1200 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.73}{1.67} = 1.15 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1044.7}{942} \text{@ center position}$$

$$D = 1.02$$

$$T_{cs} = 0.767$$

$$D = 1.06$$

$$T_{cs} = 0.805$$

$$D = 1.07$$

$$T_{cs} = 0.812$$

$$D = 1.06$$

$$T_{cs} = 0.805$$

$$D = 1.10$$

$$T_{cs} = 0.842$$

$$D = 1.13$$

$$T_{cs} = 0.873$$

$$D = 1.03$$

$$T_{cs} = 0.774$$

$$D = 1.07$$

$$T_{cs} = 0.812$$

$$D = 1.17$$

$$T_{cs} = 0.918$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 16.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.4675 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.99}{1.97} = 1.047 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{2015.84}{1467.95} \text{ @ center position}$$

$$D = 1.58$$

$$T_{\text{cs}} = 0.796$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.802$$

$$D = 1.57$$

$$T_{\text{cs}} = 0.784$$

$$D = 1.63$$

$$T_{\text{cs}} = 0.845$$

$$D = 1.63$$

$$T_{\text{cs}} = 0.845$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.814$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.802$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.814$$

$$D = 1.56$$

$$T_{\text{cs}} = 0.778$$



STATION 2  
 FILTER DE  
 FILM 2424

APERTURE 16.0  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1200 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.70}{1.67} = 1.071 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{2062.3}{1884} \text{ @ center position}$$

$$D = 1.03$$

$$T_{\text{CS}} = 0.789$$

$$D = 1.05$$

$$T_{\text{CS}} = 0.805$$

$$D = 1.02$$

$$T_{\text{CS}} = 0.782$$

$$D = 1.07$$

$$T_{\text{CS}} = 0.827$$

$$D = 1.07$$

$$T_{\text{CS}} = 0.827$$

$$D = 1.06$$

$$T_{\text{CS}} = 0.82$$

$$D = 1.05$$

$$T_{\text{CS}} = 0.805$$

$$D = 1.05$$

$$T_{\text{CS}} = 0.805$$

$$D = 1.01$$

$$T_{\text{CS}} = 0.767$$

STATION 2  
 FILTER DD  
 FILM 2424

APERTURE 16.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2469 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.39}{1.40} = 0.977 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1881.290}{1938} \text{ @ center position}$$

D = 0.56  
 T<sub>cs</sub> = 0.795

D = 0.56  
 T<sub>cs</sub> = 0.795

D = 0.53  
 T<sub>cs</sub> = 0.766

D = 0.61  
 T<sub>cs</sub> = 0.845

D = 0.59  
 T<sub>cs</sub> = 0.825

D = 0.56  
 T<sub>cs</sub> = 0.795

D = 0.58  
 T<sub>cs</sub> = 0.814

D = 0.56  
 T<sub>cs</sub> = 0.795

D = 0.53  
 T<sub>cs</sub> = 0.766

STATION 3  
 FILTER EE  
 FILM 2443, Red Layer

APERTURE 5.6  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{3.00}{1.81} = 15.49 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{3652.5}{3278} \text{ @ center position}$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

$$D = 0.08$$

$$T_{\text{cs}} = 1.16$$

STATION 3  
 FILTER EE  
 FILM 2443, Red Layer

APERTURE 5.6  
 SHUTTER 0.005

$$\left\{ W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1} \right.$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.84}{1.81} = 10.715 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 f d_{\lambda}}{t \pi 10^7 f W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{2526.9}{1639} \text{ @ center position}$$

$$D = 0.11$$

$$T_{\text{CS}} = 1.612$$

$$D = 0.11$$

$$T_{\text{CS}} = 1.612$$

$$D = 0.11$$

$$T_{\text{CS}} = 1.612$$

$$D = 0.10$$

$$T_{\text{CS}} = 1.623$$

$$D = 0.11$$

$$T_{\text{CS}} = 1.612$$

$$D = 0.10$$

$$T_{\text{CS}} = 1.623$$

$$D = 0.10$$

$$T_{\text{CS}} = 1.623$$

$$D = 0.11$$

$$T_{\text{CS}} = 1.612$$

$$D = 0.10$$

$$T_{\text{CS}} = 1.623$$

STATION 3  
 FILTER EE  
 FILM 2443, Red Layer

APERTURE 5.6  
 SHUTTER 0.0025

$$\int w_{\lambda} F_{\lambda} s_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.53}{1.81} = 5.24 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int w_{\lambda} F_{\lambda} s_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1237.64}{819.5} \text{ @ center position}$$

$$D = 0.19$$

$$T_{\text{CS}} = 1.560$$

$$D = 0.18$$

$$T_{\text{CS}} = 1.570$$

$$D = 0.19$$

$$T_{\text{CS}} = 1.560$$

$$D = 0.18$$

$$T_{\text{CS}} = 1.570$$

$$D = 0.17$$

$$T_{\text{CS}} = 1.58$$

$$D = 0.18$$

$$T_{\text{CS}} = 1.570$$

$$D = 0.19$$

$$T_{\text{CS}} = 1.560$$

$$D = 0.18$$

$$T_{\text{CS}} = 1.570$$

$$D = 0.19$$

$$T_{\text{CS}} = 1.560$$

STATION 3  
 FILTER EE  
 FILM 2443, Red Layer

APERTURE 8.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.84}{1.81} = 10.715 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{3822.94}{3278} \text{@ center position}$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.11$$

$$T_{\text{cs}} = 1.22$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

$$D = 0.12$$

$$T_{\text{cs}} = 1.214$$

STATION 3

APERTURE 8.0

FILTER EE

SHUTTER 0.005

FILM 2443, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.53}{1.81} = 5.24 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{2525.8}{1639} \text{ @ center position}$$

$$D = 0.20$$

$$T_{cs} = 1.591$$

$$D = 0.21$$

$$T_{cs} = 1.581$$

$$D = 0.21$$

$$T_{cs} = 1.581$$

$$D = 0.20$$

$$T_{cs} = 1.591$$

$$D = 0.18$$

$$T_{cs} = 1.61$$

$$D = 0.20$$

$$T_{cs} = 1.591$$

$$D = 0.20$$

$$T_{cs} = 1.591$$

$$D = 0.20$$

$$T_{cs} = 1.591$$

$$D = 0.21$$

$$T_{cs} = 1.581$$

STATION 3APERTURE 8.0FILTER EESHUTTER 0.0025FILM 2443, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.16}{1.81} = 2.238 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1077.48}{819.5} \text{ @ center position}$$

$$\begin{aligned} D &= 0.43 \\ T_{cs} &= 1.340 \end{aligned}$$

$$\begin{aligned} D &= 0.42 \\ T_{cs} &= 1.350 \end{aligned}$$

$$\begin{aligned} D &= 0.42 \\ T_{cs} &= 1.350 \end{aligned}$$

$$\begin{aligned} D &= 0.40 \\ T_{cs} &= 1.361 \end{aligned}$$

$$\begin{aligned} D &= 0.39 \\ T_{cs} &= 1.37 \end{aligned}$$

$$\begin{aligned} D &= 0.40 \\ T_{cs} &= 1.361 \end{aligned}$$

$$\begin{aligned} D &= 0.42 \\ T_{cs} &= 1.350 \end{aligned}$$

$$\begin{aligned} D &= 0.40 \\ T_{cs} &= 1.361 \end{aligned}$$

$$\begin{aligned} D &= 0.42 \\ T_{cs} &= 1.350 \end{aligned}$$



STATION 3  
 FILTER EE  
 FILM 2443, Red Layer

APERTURE 11  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.47}{1.81} = 4.57 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{4159}{3278} \text{ @ center position}$$

$$D = 0.22$$

$$T_{\text{CS}} = 1.305$$

$$D = 0.22$$

$$T_{\text{CS}} = 1.305$$

$$D = 0.22$$

$$T_{\text{CS}} = 1.305$$

$$D = 0.21$$

$$T_{\text{CS}} = 1.311$$

$$D = 0.20$$

$$T_{\text{CS}} = 1.319$$

$$D = 0.21$$

$$T_{\text{CS}} = 1.311$$

$$D = 0.21$$

$$T_{\text{CS}} = 1.311$$

$$D = 0.22$$

$$T_{\text{CS}} = 1.305$$

$$D = 0.23$$

$$T_{\text{CS}} = 1.297$$

STATION 3

APERTURE 11

FILTER EE

SHUTTER 0.0025

FILM 2443, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.85}{1.81} = 1.096 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{997.7}{819.5} \text{ @ center position}$$

$$D = 0.98$$

$$T_{\text{cs}} = 1.213$$

$$D = 0.93$$

$$T_{\text{cs}} = 1.248$$

$$D = 0.99$$

$$T_{\text{cs}} = 1.207$$

$$D = 0.94$$

$$T_{\text{cs}} = 1.241$$

$$D = 0.89$$

$$T_{\text{cs}} = 1.28$$

$$D = 0.93$$

$$T_{\text{cs}} = 1.248$$

$$D = 0.97$$

$$T_{\text{cs}} = 1.219$$

$$D = 0.93$$

$$T_{\text{cs}} = 1.248$$

$$D = 0.99$$

$$T_{\text{cs}} = 1.207$$

STATION 3APERTURE 11FILTER EESHUTTER 0.005FILM 2443, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1044 \times 10^{-1}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.15}{1.81} = 2.188 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} \quad \begin{matrix} 1990.68 \\ 1639.1 \end{matrix} \text{@ center position}$$

D = 0.43

T<sub>cs</sub> = 1.238

D = 0.41

T<sub>cs</sub> = 1.253

D = 0.43

T<sub>cs</sub> = 1.238

D = 0.41

T<sub>cs</sub> = 1.253

D = 0.39

T<sub>cs</sub> = 1.27

D = 0.41

T<sub>cs</sub> = 1.253

D = 0.44

T<sub>cs</sub> = 1.232

D = 0.41

T<sub>cs</sub> = 1.253

D = 0.43

T<sub>cs</sub> = 1.238

STATION 3APERTURE 5.6FILTER EESHUTTER 0.010FILM 2443, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.54}{1.72} = 6.6 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1558.09}{1049} \text{ center position}$$

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.14

T<sub>cs</sub> = 1.644

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

D = 0.15

T<sub>cs</sub> = 1.63

STATION 3

APERTURE 5.6

FILTER EE

SHUTTER 0.005

FILM 2443, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.29}{1.72} = 3.71 \quad @ \text{ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{876.18}{524.5} @ \text{ center position}$$

$$D = 0.18$$

$$D = 0.18$$

$$D = 0.18$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

$$D = 0.18$$

$$D = 0.18$$

$$D = 0.18$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

$$D = 0.18$$

$$D = 0.18$$

$$D = 0.18$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

$$T_{\text{cs}} = 1.83$$

STATION 3  
 FILTER EE  
 FILM 2443, Green Layer

APERTURE 5.6  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.03}{1.72} = 2.04 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{481.49}{262.2} \text{ @ center position}$$

$$D = 0.43$$

$$T_{cs} = 1.962$$

$$D = 0.40$$

$$T_{cs} = 2.004$$

$$D = 0.43$$

$$T_{cs} = 1.962$$

$$D = 0.42$$

$$T_{cs} = 1.976$$

$$D = 0.39$$

$$T_{cs} = 2.02$$

$$D = 0.41$$

$$T_{cs} = 1.989$$

$$D = 0.43$$

$$T_{cs} = 1.962$$

$$D = 0.40$$

$$T_{cs} = 2.004$$

$$D = 0.41$$

$$T_{cs} = 1.989$$

STATION 3APERTURE 8.0FILTER EESHUTTER 0.010FILM 2443, Green Layer

$$\left\{ w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2} \right.$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.29}{1.72} = 3.715 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1788.12}{1049} \text{@ center position}$$

D = 0.19

D = 0.18

D = 0.18

T<sub>cs</sub> = 1.85

T<sub>cs</sub> = 1.86

T<sub>cs</sub> = 1.86

D = 0.18

D = 0.18

D = 0.18

T<sub>cs</sub> = 1.86

T<sub>cs</sub> = 1.86

T<sub>cs</sub> = 1.86

D = 0.19

D = 0.18

D = 0.18

T<sub>cs</sub> = 1.85

T<sub>cs</sub> = 1.86

T<sub>cs</sub> = 1.86

STATION 3

APERTURE 8.0

FILTER EE

SHUTTER 0.005

FILM 2443, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.03}{1.72} = 2.04 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{982.65}{524.5} \text{ @ center position}$$

$$D = 0.45$$

$$T_{\text{cs}} = 1.96$$

$$D = 0.41$$

$$T_{\text{cs}} = 2.02$$

$$D = 0.44$$

$$T_{\text{cs}} = 1.98$$

$$D = 0.41$$

$$T_{\text{cs}} = 2.02$$

$$D = 0.39$$

$$T_{\text{cs}} = 2.05$$

$$D = 0.41$$

$$T_{\text{cs}} = 2.02$$

$$D = 0.43$$

$$T_{\text{cs}} = 1.99$$

$$D = 0.41$$

$$T_{\text{cs}} = 2.02$$

$$D = 0.43$$

$$T_{\text{cs}} = 1.99$$



STATION 3  
 FILTER EE  
 FILM 2443, Green Layer

APERTURE 8.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.74}{1.72} = 1.047 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{503.96}{262.26} \text{ @ center position}$$

$$D = 1.03$$

$$T_{\text{cs}} = 1.99$$

$$D = 0.99$$

$$T_{\text{cs}} = 2.04$$

$$D = 1.01$$

$$T_{\text{cs}} = 2.02$$

$$D = 0.99$$

$$T_{\text{cs}} = 2.04$$

$$D = 0.95$$

$$T_{\text{cs}} = 2.10$$

$$D = 0.98$$

$$T_{\text{cs}} = 2.06$$

$$D = 1.03$$

$$T_{\text{cs}} = 1.99$$

$$D = 0.97$$

$$T_{\text{cs}} = 2.07$$

$$D = 1.02$$

$$T_{\text{cs}} = 2.01$$

STATION 3

APERTURE 11

FILTER EE

SHUTTER 0.010

FILM 2443, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.05}{1.72} = 2.08 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1901.09}{1049.1} \text{@ center position}$$

$$D = 0.42$$

$$T_{\text{cs}} = 1.92$$

$$D = 0.40$$

$$T_{\text{cs}} = 1.95$$

$$D = 0.40$$

$$T_{\text{cs}} = 1.95$$

$$D = 0.39$$

$$T_{\text{cs}} = 1.96$$

$$D = 0.37$$

$$T_{\text{cs}} = 1.98$$

$$D = 0.39$$

$$T_{\text{cs}} = 1.96$$

$$D = 0.41$$

$$T_{\text{cs}} = 1.94$$

$$D = 0.39$$

$$T_{\text{cs}} = 1.96$$

$$D = 0.41$$

$$T_{\text{cs}} = 1.94$$

STATION 3APERTURE 11FILTER EESHUTTER 0.005FILM 2443, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3341 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.75}{1.72} = 1.07 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{974.9}{524.5} \quad \text{@ center position}$$

D = 1.00

D = 0.95

D = 0.98

T<sub>cs</sub> = 1.92

T<sub>cs</sub> = 1.98

T<sub>cs</sub> = 1.94

D = 0.98

D = 0.92

D = 0.95

T<sub>cs</sub> = 1.94

T<sub>cs</sub> = 2.03

T<sub>cs</sub> = 1.98

D = 1.01

D = 0.96

D = 0.99

T<sub>cs</sub> = 1.91

T<sub>cs</sub> = 1.97

T<sub>cs</sub> = 1.94

STATION 3  
 FILTER EE  
 FILM 2443, Green Layer

APERTURE 11  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7151 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.48}{1.55} = 0.85 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{774.47}{561.4} \text{ @ center position}$$

$$D = 1.85$$

$$T_{\text{cs}} = 1.57$$

$$D = 1.80$$

$$T_{\text{cs}} = 1.62$$

$$D = 1.84$$

$$T_{\text{cs}} = 1.58$$

$$D = 1.79$$

$$T_{\text{cs}} = 1.63$$

$$D = 1.75$$

$$T_{\text{cs}} = 1.50$$

$$D = 1.79$$

$$T_{\text{cs}} = 1.63$$

$$D = 1.85$$

$$T_{\text{cs}} = 1.57$$

$$D = 1.80$$

$$T_{\text{cs}} = 1.62$$

$$D = 1.85$$

$$T_{\text{cs}} = 1.57$$

STATION 3  
 FILTER EE  
 FILM 2443, Blue Layer

APERTURE 5.6  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.37}{1.69} = 4.79 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1128.74}{1922} \text{@ center position}$$

$$D = 0.23$$

$$T_{\text{cs}} = 0.63$$

$$D = 0.22$$

$$T_{\text{cs}} = 0.634$$

$$D = 0.22$$

$$T_{\text{cs}} = 0.634$$

$$D = 0.23$$

$$T_{\text{cs}} = 0.63$$

$$D = 0.23$$

$$T_{\text{cs}} = 0.63$$

$$D = 0.22$$

$$T_{\text{cs}} = 0.634$$

$$D = 0.22$$

$$T_{\text{cs}} = 0.634$$

$$D = 0.23$$

$$T_{\text{cs}} = 0.63$$

$$D = 0.23$$

$$T_{\text{cs}} = 0.63$$

STATION 3

APERTURE 5.6

FILTER EE

SHUTTER 0.005

FILM 2443, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.16}{1.69} = 2.95 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{695.9}{961} \text{ @ center position}$$

$$D = 0.34$$

$$D = 0.32$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.76$$

$$T_{\text{cs}} = 0.77$$

$$T_{\text{cs}} = 0.76$$

$$D = 0.32$$

$$D = 0.32$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.77$$

$$T_{\text{cs}} = 0.77$$

$$T_{\text{cs}} = 0.77$$

$$D = 0.33$$

$$D = 0.31$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.76$$

$$T_{\text{cs}} = 0.723$$

$$T_{\text{cs}} = 0.77$$

STATION 3APERTURE 5.6FILTER EESHUTTER 0.0025FILM 2443, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.90}{1.69} = 1.62 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{382.46}{480.5} \text{ @ center position}$$

$$D = 0.61$$

$$T_{\text{cs}} = 0.834$$

$$D = 0.58$$

$$T_{\text{cs}} = 0.843$$

$$D = 0.60$$

$$T_{\text{cs}} = 0.837$$

$$D = 0.60$$

$$T_{\text{cs}} = 0.837$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.846$$

$$D = 0.59$$

$$T_{\text{cs}} = 0.840$$

$$D = 0.59$$

$$T_{\text{cs}} = 0.840$$

$$D = 0.55$$

$$T_{\text{cs}} = 0.853$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.846$$

STATION 3  
 FILTER EE  
 FILM 2443, Blue Layer

APERTURE 8.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.17}{1.69} = 3.02 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1453.4}{1922.3} \text{ @ center position}$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.811$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.811$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.811$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.815$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.815$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.815$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.811$$

$$D = 0.32$$

$$T_{\text{cs}} = 0.815$$

$$D = 0.33$$

$$T_{\text{cs}} = 0.811$$



STATION 3

APERTURE 8.0

FILTER EE

SHUTTER 0.005

FILM 2443, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.91}{1.69} = 1.66 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{798.73}{961.1} \text{ @ center position}$$

$$\begin{aligned} D &= 0.64 \\ T_{\text{CS}} &= 0.862 \end{aligned}$$

$$\begin{aligned} D &= 0.60 \\ T_{\text{CS}} &= 0.875 \end{aligned}$$

$$\begin{aligned} D &= 0.62 \\ T_{\text{CS}} &= 0.869 \end{aligned}$$

$$\begin{aligned} D &= 0.59 \\ T_{\text{CS}} &= 0.879 \end{aligned}$$

$$\begin{aligned} D &= 0.56 \\ T_{\text{CS}} &= 0.890 \end{aligned}$$

$$\begin{aligned} D &= 0.59 \\ T_{\text{CS}} &= 0.879 \end{aligned}$$

$$\begin{aligned} D &= 0.61 \\ T_{\text{CS}} &= 0.872 \end{aligned}$$

$$\begin{aligned} D &= 0.59 \\ T_{\text{CS}} &= 0.899 \end{aligned}$$

$$\begin{aligned} D &= 0.61 \\ T_{\text{CS}} &= 0.872 \end{aligned}$$

STATION 3  
 FILTER EE  
 FILM 2443, Blue Layer

APERTURE 8.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.9422 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.61}{1.58} = 1.072 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{515.70}{739.6} \text{ @ center position}$$

$$D = 1.53$$

$$T_{cs} = 0.787$$

$$D = 1.46$$

$$T_{cs} = 0.808$$

$$D = 1.49$$

$$T_{cs} = 0.800$$

$$D = 1.44$$

$$T_{cs} = 0.838$$

$$D = 1.37$$

$$T_{cs} = 0.838$$

$$D = 1.41$$

$$T_{cs} = 0.824$$

$$D = 1.50$$

$$T_{cs} = 0.796$$

$$D = 1.41$$

$$T_{cs} = 0.824$$

$$D = 1.47$$

$$T_{cs} = 0.806$$

STATION 3  
 FILTER EE  
 FILM 2443, Blue Layer

APERTURE 11  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6122 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.92}{1.69} = 1.69 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{1545.27}{1922.3} \text{ @ center position}$$

$$D = 0.60$$

$$T_{\text{cs}} = 0.84$$

$$D = 0.58$$

$$T_{\text{cs}} = 0.847$$

$$D = 0.58$$

$$T_{\text{cs}} = 0.847$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.851$$

$$D = 0.54$$

$$T_{\text{cs}} = 0.86$$

$$D = 0.56$$

$$T_{\text{cs}} = 0.854$$

$$D = 0.58$$

$$T_{\text{cs}} = 0.847$$

$$D = 0.55$$

$$T_{\text{cs}} = 0.856$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.851$$

STATION 3APERTURE 11FILTER EESHUTTER 0.005FILM 2443, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.9422 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.62}{1.58} = 1.096 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{997.7}{1479} \quad \text{@ center position}$$

D = 1.49

D = 1.40

D = 1.43

T<sub>cs</sub> = 0.76

T<sub>cs</sub> = 0.78

T<sub>cs</sub> = 0.78

D = 1.42

D = 1.33

D = 1.37

T<sub>cs</sub> = 0.78

T<sub>cs</sub> = 0.81

T<sub>cs</sub> = 0.79

D = 1.46

D = 1.38

D = 1.44

T<sub>cs</sub> = 0.77

T<sub>cs</sub> = 0.79

T<sub>cs</sub> = 0.77

STATION 3APERTURE 11FILTER EESHUTTER 0.0025FILM 2443, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.9422 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.35}{1.58} = .8544 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{535.8}{739.6} \quad \text{@ center position}$$

D = 3.13

T<sub>cs</sub> = 0.92

D = 3.01

T<sub>cs</sub> = 0.96

D = 3.07

T<sub>cs</sub> = 0.94

D = 3.02

T<sub>cs</sub> = 0.96

D = 2.90

T<sub>cs</sub> = 1.0

D = 2.96

T<sub>cs</sub> = 0.98

D = 3.07

T<sub>cs</sub> = 0.94

D = 2.97

T<sub>cs</sub> = 0.97

D = 3.02

T<sub>cs</sub> = 0.96

STATION 4  
 FILTER FF  
 FILM SO-356, Red Layer

APERTURE 2.8  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.23}{1.62} = 4.07 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{240.17}{687.03} \text{@ center position}$$

$$D = 0.29$$

$$T_{cs} = 0.352$$

$$D = 0.28$$

$$T_{cs} = 0.355$$

$$D = 0.27$$

$$T_{cs} = 0.360$$

$$D = 0.27$$

$$T_{cs} = 0.360$$

$$D = 0.25$$

$$T_{cs} = 0.365$$

$$D = 0.26$$

$$T_{cs} = 0.372$$

$$D = 0.25$$

$$T_{cs} = 0.365$$

$$D = 0.25$$

$$T_{cs} = 0.365$$

$$D = 0.26$$

$$T_{cs} = 0.372$$

STATION 4 APERTURE 2.8  
 FILTER FF SHUTTER 0.005  
 FILM SO-356, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.95}{1.62} = 2.137 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{126.05}{343.5} \text{ @ center position}$$

$$D = 0.59$$

$$T_{\text{cs}} = 0.359$$

$$D = 0.55$$

$$T_{\text{cs}} = 0.373$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.366$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.366$$

$$D = 0.53$$

$$T_{\text{cs}} = 0.38$$

$$D = 0.54$$

$$T_{\text{cs}} = 0.376$$

$$D = 0.55$$

$$T_{\text{cs}} = 0.373$$

$$D = 0.52$$

$$T_{\text{cs}} = 0.384$$

$$D = 0.54$$

$$T_{\text{cs}} = 0.376$$

STATION 4APERTURE 2.8FILTER FFSHUTTER 0.0025FILM SO-356, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.62}{1.62} = 1.0 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{58.95}{171.76} \text{ @ center position}$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.331$$

$$D = 1.04$$

$$T_{\text{cs}} = 0.344$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.331$$

$$D = 1.03$$

$$T_{\text{cs}} = 0.347$$

$$D = 0.99$$

$$T_{\text{cs}} = 0.359$$

$$D = 1.03$$

$$T_{\text{cs}} = 0.347$$

$$D = 1.03$$

$$T_{\text{cs}} = 0.347$$

$$D = 1.01$$

$$T_{\text{cs}} = 0.353$$

$$D = 1.05$$

$$T_{\text{cs}} = 0.341$$



STATION 4APERTURE 3.5FILTER FFSHUTTER 0.010FILM SO-356, Red Layer

$$\int w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.11}{1.62} = 3.09 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int w_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{284.67}{687.03} \quad \text{@ center position}$$

D = 0.39

D = 0.39

D = 0.39

T<sub>cs</sub> = 0.355

T<sub>cs</sub> = 0.355

T<sub>cs</sub> = 0.355

D = 0.38

D = 0.35

D = 0.38

T<sub>cs</sub> = 0.422

T<sub>cs</sub> = 0.433

T<sub>cs</sub> = 0.422

D = 0.38

D = 0.35

D = 0.36

T<sub>cs</sub> = 0.422

T<sub>cs</sub> = 0.433

T<sub>cs</sub> = 0.429

STATION 4APERTURE 3.5FILTER FFSHUTTER 0.005FILM SO-356, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.81}{1.62} = 1.55 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{142.68}{343.52} \text{ @ center position}$$

D = 0.77

T<sub>cs</sub> = 0.412

D = 0.77

T<sub>cs</sub> = 0.412

D = 0.77

T<sub>cs</sub> = 0.412

D = 0.76

T<sub>cs</sub> = 0.415

D = 0.71

T<sub>cs</sub> = 0.435

D = 0.73

T<sub>cs</sub> = 0.427

D = 0.73

T<sub>cs</sub> = 0.427

D = 0.71

T<sub>cs</sub> = 0.435

D = 0.73

T<sub>cs</sub> = 0.427

STATION 4  
 FILTER FF  
 FILM SO-356, Red Layer

APERTURE 3.5  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.50}{1.62} = 0.759 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{69.88}{171.76} \quad \text{@ center position}$$

$$D = 1.34$$

$$T_{cs} = 0.389$$

$$D = 1.30$$

$$T_{cs} = 0.404$$

$$D = 1.30$$

$$T_{cs} = 0.404$$

$$D = 1.29$$

$$T_{cs} = 0.408$$

$$D = 1.24$$

$$T_{cs} = 0.426$$

$$D = 1.28$$

$$T_{cs} = 0.411$$

$$D = 1.27$$

$$T_{cs} = 0.415$$

$$D = 1.27$$

$$T_{cs} = 0.415$$

$$D = 1.29$$

$$T_{cs} = 0.408$$

STATION 4APERTURE 4.0FILTER FFSHUTTER 0.010FILM SO-356, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.95}{1.62} = 2.137 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{257.24}{687.03} \text{ @ center position}$$

D = 0.57

D = 0.53

D = 0.58

T<sub>cs</sub> = 0.378

T<sub>cs</sub> = 0.392

T<sub>cs</sub> = 0.374

D = 0.55

D = 0.53

D = 0.55

T<sub>cs</sub> = 0.385

T<sub>cs</sub> = 0.392

T<sub>cs</sub> = 0.385

D = 0.54

D = 0.52

D = 0.54

T<sub>cs</sub> = 0.389

T<sub>cs</sub> = 0.395

T<sub>cs</sub> = 0.389

STATION 4  
 FILTER FF  
 FILM WO-356, Red Layer

APERTURE 4.0  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2188 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.63}{1.62} = 1.023 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{123.12}{343.52} \text{ @ center position}$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.340$$

$$D = 1.07$$

$$T_{\text{cs}} = 0.342$$

$$D = 1.06$$

$$T_{\text{cs}} = 0.345$$

$$D = 1.01$$

$$T_{\text{cs}} = 0.362$$

$$D = 0.97$$

$$T_{\text{cs}} = 0.375$$

$$D = 1.03$$

$$T_{\text{cs}} = 0.355$$

$$D = 1.05$$

$$T_{\text{cs}} = 0.349$$

$$D = 1.00$$

$$T_{\text{cs}} = 0.365$$

$$D = 1.04$$

$$T_{\text{cs}} = 0.352$$

STATION 4

APERTURE 4.0

FILTER FF

SHUTTER 0.0025

FILM SO-356, Red Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2423 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.39}{1.40} = 0.977 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{117.58}{190.2} \text{ @ center position}$$

$$\begin{aligned} D &= 1.60 \\ T_{\text{cs}} &= 0.656 \end{aligned}$$

$$\begin{aligned} D &= 1.58 \\ T_{\text{cs}} &= 0.669 \end{aligned}$$

$$\begin{aligned} D &= 1.60 \\ T_{\text{cs}} &= 0.656 \end{aligned}$$

$$\begin{aligned} D &= 1.55 \\ T_{\text{cs}} &= 0.687 \end{aligned}$$

$$\begin{aligned} D &= 1.54 \\ T_{\text{cs}} &= 0.693 \end{aligned}$$

$$\begin{aligned} D &= 1.55 \\ T_{\text{cs}} &= 0.687 \end{aligned}$$

$$\begin{aligned} D &= 1.55 \\ T_{\text{cs}} &= 0.687 \end{aligned}$$

$$\begin{aligned} D &= 1.53 \\ T_{\text{cs}} &= 0.701 \end{aligned}$$

$$\begin{aligned} D &= 1.56 \\ T_{\text{cs}} &= 0.682 \end{aligned}$$

STATION 4

APERTURE 2.8

FILTER FF

SHUTTER 0.010

FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{2.09}{1.61} = 3.02 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{178.04}{314.94} \text{ @ center position}$$

$$D = 0.35$$

$$T_{\text{CS}} = 0.597$$

$$D = 0.33$$

$$T_{\text{CS}} = 0.608$$

$$D = 0.33$$

$$T_{\text{CS}} = 0.608$$

$$D = 0.33$$

$$T_{\text{CS}} = 0.608$$

$$D = 0.31$$

$$T_{\text{CS}} = 0.619$$

$$D = 0.32$$

$$T_{\text{CS}} = 0.613$$

$$D = 0.31$$

$$T_{\text{CS}} = 0.619$$

$$D = 0.31$$

$$T_{\text{CS}} = 0.619$$

$$D = 0.32$$

$$T_{\text{CS}} = 0.613$$

STATION 4APERTURE 2.8FILTER FFSHUTTER 0.005FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.78}{1.61} = 1.48 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{87.20}{157.47} \text{ @ center position}$$

D = 0.75

T<sub>cs</sub> = 0.574

D = 0.71

T<sub>cs</sub> = 0.597

D = 0.73

T<sub>cs</sub> = 0.585

D = 0.74

T<sub>cs</sub> = 0.579

D = 0.69

T<sub>cs</sub> = 0.607

D = 0.70

T<sub>cs</sub> = 0.602

D = 0.72

T<sub>cs</sub> = 0.590

D = 0.68

T<sub>cs</sub> = 0.613

D = 0.71

T<sub>cs</sub> = 0.597



STATION 4

APERTURE 2.8

FILTER FF

SHUTTER 0.0025

FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.49}{1.61} = 0.759 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{44.72}{78.74} \quad \text{@ center position}$$

$$D = 1.37$$

$$T_{cs} = 0.626$$

$$D = 1.33$$

$$T_{cs} = 0.651$$

$$D = 1.36$$

$$T_{cs} = 0.632$$

$$D = 1.31$$

$$T_{cs} = 0.664$$

$$D = 1.28$$

$$T_{cs} = 0.683$$

$$D = 1.31$$

$$T_{cs} = 0.664$$

$$D = 1.33$$

$$T_{cs} = 0.651$$

$$D = 1.31$$

$$T_{cs} = 0.664$$

$$D = 1.35$$

$$T_{cs} = 0.638$$

STATION 4

APERTURE 3.5

FILTER FF

SHUTTER 0.010

FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.87}{1.61} = 1.82 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{167.63}{314.94} \text{ @ center position}$$

$$D = 0.49$$

$$D = 0.47$$

$$D = 0.48$$

$$T_{cs} = 0.556$$

$$T_{cs} = 0.567$$

$$T_{cs} = 0.561$$

$$D = 0.46$$

$$D = 0.44$$

$$D = 0.47$$

$$T_{cs} = 0.572$$

$$T_{cs} = 0.583$$

$$T_{cs} = 0.567$$

$$D = 0.47$$

$$D = 0.44$$

$$D = 0.46$$

$$T_{cs} = 0.567$$

$$T_{cs} = 0.583$$

$$T_{cs} = 0.572$$

STATION 4APERTURE 3.5FILTER FFSHUTTER 0.005FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.64}{1.61} = 1.071 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{98.71}{157.47} @ \text{ center position}$$

D = 0.99

T<sub>cs</sub> = 0.649

D = 0.98

T<sub>cs</sub> = 0.655

D = 0.98

T<sub>cs</sub> = 0.655

D = 0.98

T<sub>cs</sub> = 0.655

D = 0.93

T<sub>cs</sub> = 0.687

D = 0.95

T<sub>cs</sub> = 0.674

D = 0.95

T<sub>cs</sub> = 0.674

D = 0.92

T<sub>cs</sub> = 0.694

D = 0.95

T<sub>cs</sub> = 0.674

STATION 4APERTURE 3.5FILTER FFSHUTTER 0.0025FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1829 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.26}{1.39} = 0.74 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{68.29}{143.58} \text{ @ center position}$$

D = 1.65

D = 1.62

D = 1.60

T<sub>cs</sub> = 0.525

T<sub>cs</sub> = 0.541

T<sub>cs</sub> = 0.551

D = 1.59

D = 1.56

D = 1.56

T<sub>cs</sub> = 0.557

T<sub>cs</sub> = 0.572

T<sub>cs</sub> = 0.572

D = 1.57

D = 1.59

D = 1.61

T<sub>cs</sub> = 0.566

T<sub>cs</sub> = 0.557

T<sub>cs</sub> = 0.546

STATION 4 APERTURE 4.0  
 FILTER FF SHUTTER 0.010  
 FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.78}{1.61} = 1.479 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{177.97}{314.94} \text{ @ center position}$$

$$D = 0.73$$

$$T_{\text{cs}} = 0.596$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.619$$

$$D = 0.74$$

$$T_{\text{cs}} = 0.591$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.607$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.619$$

$$D = 0.72$$

$$T_{\text{cs}} = 0.659$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.607$$

$$D = 0.68$$

$$T_{\text{cs}} = 0.625$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.619$$

STATION 4APERTURE 4.0FILTER FFSHUTTER 0.005FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1003 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.44}{1.61} = 0.676 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{81.35}{157.47} \text{ @ center position}$$

$$D = 1.36$$

$$T_{\text{cs}} = 0.521$$

$$D = 1.36$$

$$T_{\text{cs}} = 0.521$$

$$D = 1.34$$

$$T_{\text{cs}} = 0.53$$

$$D = 1.31$$

$$T_{\text{cs}} = 0.546$$

$$D = 1.27$$

$$T_{\text{cs}} = 0.567$$

$$D = 1.32$$

$$T_{\text{cs}} = 0.54$$

$$D = 1.34$$

$$T_{\text{cs}} = 0.53$$

$$D = 1.30$$

$$T_{\text{cs}} = 0.55$$

$$D = 1.33$$

$$T_{\text{cs}} = 0.534$$

STATION 4APERTURE 4.0FILTER PFSHUTTER 0.0025FILM SO-356, Green Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1829 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.24}{1.39} = 0.7079 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{85.18}{143.58} \text{ @ center position}$$

$$\begin{aligned} D &= 1.93 \\ T_{\text{cs}} &= 0.679 \end{aligned}$$

$$\begin{aligned} D &= 1.92 \\ T_{\text{cs}} &= 0.686 \end{aligned}$$

$$\begin{aligned} D &= 1.92 \\ T_{\text{cs}} &= 0.686 \end{aligned}$$

$$\begin{aligned} D &= 1.86 \\ T_{\text{cs}} &= 0.726 \end{aligned}$$

$$\begin{aligned} D &= 1.88 \\ T_{\text{cs}} &= 0.713 \end{aligned}$$

$$\begin{aligned} D &= 1.88 \\ T_{\text{cs}} &= 0.713 \end{aligned}$$

$$\begin{aligned} D &= 1.92 \\ T_{\text{cs}} &= 0.686 \end{aligned}$$

$$\begin{aligned} D &= 1.85 \\ T_{\text{cs}} &= 0.733 \end{aligned}$$

$$\begin{aligned} D &= 1.87 \\ T_{\text{cs}} &= 0.72 \end{aligned}$$

STATION 4APERTURE 2.8FILTER FFSHUTTER 0.010FILM SO-356, Blue Layer

$$\left\{ W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3230 \times 10^{-3} \right.$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.33}{1.57} = 0.575 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{33.93}{101.4} \text{ @ center position}$$

D = 0.87

D = 0.84

D = 0.85

T<sub>cs</sub> = 0.363

T<sub>cs</sub> = 0.373

T<sub>cs</sub> = 0.37

D = 0.83

D = 0.81

D = 0.81

T<sub>cs</sub> = 0.371

T<sub>cs</sub> = 0.383

T<sub>cs</sub> = 0.383

D = 0.84

D = 0.82

D = 0.84

T<sub>cs</sub> = 0.373

T<sub>cs</sub> = 0.38

T<sub>cs</sub> = 0.373



STATION 4APERTURE 2.8FILTER FFSHUTTER 0.005FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3230 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.44}{1.57} = 0.741 \quad \text{@ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{43.71}{50.7} \text{ @ center position}$$

D = 1.33

D = 1.31

D = 1.33

T<sub>CS</sub> = 0.936

T<sub>CS</sub> = 0.954

T<sub>CS</sub> = 0.936

D = 1.31

D = 1.27

D = 1.30

T<sub>CS</sub> = 0.954

T<sub>CS</sub> = 0.989

T<sub>CS</sub> = 0.962

D = 1.32

D = 1.28

D = 1.31

T<sub>CS</sub> = 0.945

T<sub>CS</sub> = 0.98

T<sub>CS</sub> = 0.954

STATION 4APERTURE 2.8FILTER FFSHUTTER 0.0025FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6497 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.22}{1.25} = 0.933 \quad @ \text{ center position}$$

$$T_{\text{CS}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{55.01}{51.0} @ \text{ center position}$$

$$\begin{aligned} D &= 1.94 \\ T_{\text{CS}} &= 1.559 \end{aligned}$$

$$\begin{aligned} D &= 1.90 \\ T_{\text{CS}} &= 1.618 \end{aligned}$$

$$\begin{aligned} D &= 1.94 \\ T_{\text{CS}} &= 1.559 \end{aligned}$$

$$\begin{aligned} D &= 1.89 \\ T_{\text{CS}} &= 1.634 \end{aligned}$$

$$\begin{aligned} D &= 1.85 \\ T_{\text{CS}} &= 1.70 \end{aligned}$$

$$\begin{aligned} D &= 1.90 \\ T_{\text{CS}} &= 1.618 \end{aligned}$$

$$\begin{aligned} D &= 1.90 \\ T_{\text{CS}} &= 1.618 \end{aligned}$$

$$\begin{aligned} D &= 1.87 \\ T_{\text{CS}} &= 1.664 \end{aligned}$$

$$\begin{aligned} D &= 1.90 \\ T_{\text{CS}} &= 1.618 \end{aligned}$$

STATION 4

APERTURE 3.5

FILTER FF

SHUTTER 0.010

FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3230 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.58}{1.57} = 1.024 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{94.27}{101.4} \text{ @ center position}$$

$$D = 1.04$$

$$T_{\text{cs}} = 1.018$$

$$D = 1.01$$

$$T_{\text{cs}} = 1.047$$

$$D = 1.04$$

$$T_{\text{cs}} = 1.018$$

$$D = 1.02$$

$$T_{\text{cs}} = 1.037$$

$$D = 0.99$$

$$T_{\text{cs}} = 1.067$$

$$D = 1.02$$

$$T_{\text{cs}} = 1.037$$

$$D = 1.03$$

$$T_{\text{cs}} = 1.027$$

$$D = 1.00$$

$$T_{\text{cs}} = 1.056$$

$$D = 1.02$$

$$T_{\text{cs}} = 1.037$$

STATION 4APERTURE 3.5FILTER FFSHUTTER 0.005FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6497 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.25}{1.25} = 1.0$$

@ center position

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{92.12}{102.0} \text{ @ center position}$$

D = 1.59

T<sub>cs</sub> = 1.328

D = 1.57

T<sub>cs</sub> = 1.354

D = 1.59

T<sub>cs</sub> = 1.328

D = 1.56

T<sub>cs</sub> = 1.366

D = 1.51

T<sub>cs</sub> = 1.43

D = 1.54

T<sub>cs</sub> = 1.392

D = 1.55

T<sub>cs</sub> = 1.379

D = 1.52

T<sub>cs</sub> = 1.419

D = 1.55

T<sub>cs</sub> = 1.379

STATION	<u>4</u>	APERTURE	<u>3.5</u>
FILTER	<u>FF</u>	SHUTTER	<u>0.0025</u>
FILM	<u>SO-356, Blue Layer</u>		

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6497 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.09}{1.25} = 0.69 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{63.56}{51.00} \text{ @ center position}$$

$$D = 2.20$$

$$T_{cs} = 1.84$$

$$D = 2.16$$

$$T_{cs} = 1.902$$

$$D = 2.17$$

$$T_{cs} = 1.891$$

$$D = 2.15$$

$$T_{cs} = 1.927$$

$$D = 2.12$$

$$T_{cs} = 1.98$$

$$D = 2.14$$

$$T_{cs} = 1.945$$

$$D = 2.15$$

$$T_{cs} = 1.927$$

$$D = 2.16$$

$$T_{cs} = 1.902$$

$$D = 2.18$$

$$T_{cs} = 1.873$$

STATION 4

APERTURE 4.0

FILTER FF

SHUTTER 0.010

FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3230 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.45}{1.57} = 0.759 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{91.27}{101.4} \text{ @ center position}$$

$$D = 1.31$$

$$T_{\text{cs}} = 0.985$$

$$D = 1.27$$

$$T_{\text{cs}} = 1.023$$

$$D = 1.31$$

$$T_{\text{cs}} = 0.985$$

$$D = 1.29$$

$$T_{\text{cs}} = 1.003$$

$$D = 1.26$$

$$T_{\text{cs}} = 1.032$$

$$D = 1.29$$

$$T_{\text{cs}} = 1.003$$

$$D = 1.30$$

$$T_{\text{cs}} = 0.994$$

$$D = 1.28$$

$$T_{\text{cs}} = 1.013$$

$$D = 1.30$$

$$T_{\text{cs}} = 0.994$$

STATION 4 APERTURE 4.0  
 FILTER FF SHUTTER 0.005  
 FILM SO-356, Blue Layer

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6497 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.21}{1.25} = 0.912 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{109.73}{102.0} \text{ @ center position}$$

$$D = 1.95$$

$$T_{cs} = 1.568$$

$$D = 1.92$$

$$T_{cs} = 1.612$$

$$D = 1.92$$

$$T_{cs} = 1.612$$

$$D = 1.89$$

$$T_{cs} = 1.656$$

$$D = 1.86$$

$$T_{cs} = 1.704$$

$$D = 1.91$$

$$T_{cs} = 1.626$$

$$D = 1.91$$

$$T_{cs} = 1.626$$

$$D = 1.89$$

$$T_{cs} = 1.656$$

$$D = 1.93$$

$$T_{cs} = 1.596$$

STATION 4  
 FILTER FF  
 FILM SO-356, Blue Layer

APERTURE 4.0  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6497 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{0.95}{1.25} = 0.501 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{60.3}{51.0} \quad \text{@ center position}$$

$$D = 2.43$$

$$T_{\text{cs}} = 1.805$$

$$D = 2.42$$

$$T_{\text{cs}} = 1.823$$

$$D = 2.43$$

$$T_{\text{cs}} = 1.805$$

$$D = 2.40$$

$$T_{\text{cs}} = 1.856$$

$$D = 2.39$$

$$T_{\text{cs}} = 1.873$$

$$D = 2.41$$

$$T_{\text{cs}} = 1.839$$

$$D = 2.43$$

$$T_{\text{cs}} = 1.805$$

$$D = 2.38$$

$$T_{\text{cs}} = 1.891$$

$$D = 2.40$$

$$T_{\text{cs}} = 1.856$$



STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.010

$$\left\{ W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.4244 \times 10^{-3} \right.$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.86}{1.77} = 1.23 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 f d_{\lambda}}{t \pi 10^7 f W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{113.33}{133.26} \text{ @ center position}$$

$$D = 2.07$$

$$T_{\text{cs}} = 0.657$$

$$D = 2.08$$

$$T_{\text{cs}} = 0.666$$

$$D = 2.05$$

$$T_{\text{cs}} = 0.642$$

$$D = 2.10$$

$$T_{\text{cs}} = 0.682$$

$$D = 2.15$$

$$T_{\text{cs}} = 0.602$$

$$D = 2.12$$

$$T_{\text{cs}} = 0.698$$

$$D = 2.09$$

$$T_{\text{cs}} = 0.673$$

$$D = 2.11$$

$$T_{\text{cs}} = 0.689$$

$$D = 2.07$$

$$T_{\text{cs}} = 0.657$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7236 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.58}{1.56} = 1.047 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{96.46}{113.6} \text{ @ center position}$$

$$D = 1.57$$

$$T_{\text{cs}} = 0.703$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.729$$

$$D = 1.56$$

$$T_{\text{cs}} = 0.694$$

$$D = 1.64$$

$$T_{\text{cs}} = 0.764$$

$$D = 1.67$$

$$T_{\text{cs}} = 0.722$$

$$D = 1.62$$

$$T_{\text{cs}} = 0.746$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.729$$

$$D = 1.65$$

$$T_{\text{cs}} = 0.733$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.729$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1256 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.33}{1.35} = 0.955 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{87.97}{98.596} @ \text{ center position}$$

$$D = 1.04$$

$$T_{cs} = 0.75$$

$$D = 1.08$$

$$T_{cs} = 0.787$$

$$D = 1.03$$

$$T_{cs} = 0.741$$

$$D = 1.12$$

$$T_{cs} = 0.826$$

$$D = 1.17$$

$$T_{cs} = 0.795$$

$$D = 1.11$$

$$T_{cs} = 0.816$$

$$D = 1.08$$

$$T_{cs} = 0.787$$

$$D = 1.13$$

$$T_{cs} = 0.836$$

$$D = 1.08$$

$$T_{cs} = 0.787$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7236 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.58}{1.56} = 1.047 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{173.9}{227.2} \text{ @ center position}$$

$$D = 1.56$$

$$T_{\text{cs}} = 0.626$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.665$$

$$D = 1.54$$

$$T_{\text{cs}} = 0.611$$

$$D = 1.62$$

$$T_{\text{cs}} = 0.673$$

$$D = 1.67$$

$$T_{\text{cs}} = 0.652$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.657$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.665$$

$$D = 1.64$$

$$T_{\text{cs}} = 0.689$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.649$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1256 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.32}{1.35} = 0.933 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{155.03}{197.19} \text{ @ center position}$$

$$D = 1.03$$

$$T_{\text{cs}} = 0.669$$

$$D = 1.07$$

$$T_{\text{cs}} = 0.702$$

$$D = 1.02$$

$$T_{\text{cs}} = 0.662$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.711$$

$$D = 1.15$$

$$T_{\text{cs}} = 0.70$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.711$$

$$D = 1.07$$

$$T_{\text{cs}} = 0.702$$

$$D = 1.12$$

$$T_{\text{cs}} = 0.745$$

$$D = 1.07$$

$$T_{\text{cs}} = 0.702$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3283 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.03}{0.97} = 1.148 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{190.7}{257.7} \text{ @ center position}$$

$$D = 0.58$$

$$T_{cs} = 0.865$$

$$D = 0.62$$

$$T_{cs} = 0.908$$

$$D = 0.58$$

$$T_{cs} = 0.865$$

$$D = 0.64$$

$$T_{cs} = 0.929$$

$$D = 0.68$$

$$T_{cs} = 0.975$$

$$D = 0.64$$

$$T_{cs} = 0.929$$

$$D = 0.62$$

$$T_{cs} = 0.908$$

$$D = 0.65$$

$$T_{cs} = 0.941$$

$$D = 0.62$$

$$T_{cs} = 0.908$$

STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 6.3  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1256 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.30}{1.35} = 0.89 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{266.01}{394.38} \text{ @ center position}$$

$$D = 1.01$$

$$T_{\text{cs}} = 0.574$$

$$D = 1.05$$

$$T_{\text{cs}} = 0.602$$

$$D = 0.99$$

$$T_{\text{cs}} = 0.56$$

$$D = 1.07$$

$$T_{\text{cs}} = 0.616$$

$$D = 1.13$$

$$T_{\text{cs}} = 0.601$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.624$$

$$D = 1.04$$

$$T_{\text{cs}} = 0.595$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.631$$

$$D = 1.04$$

$$T_{\text{cs}} = 0.595$$

STATION 5  
 FILTER JJ  
 FILMSO-022

APERTURE 6.3  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3283 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.02}{0.97} = 1.12 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{334.89}{515.43} \text{ @ center position}$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.759$$

$$D = 0.61$$

$$T_{\text{cs}} = 0.796$$

$$D = 0.57$$

$$T_{\text{cs}} = 0.759$$

$$D = 0.63$$

$$T_{\text{cs}} = 0.816$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.855$$

$$D = 0.63$$

$$T_{\text{cs}} = 0.816$$

$$D = 0.61$$

$$T_{\text{cs}} = 0.796$$

$$D = 0.64$$

$$T_{\text{cs}} = 0.825$$

$$D = 0.61$$

$$T_{\text{cs}} = 0.796$$



STATION 5  
 FILTER JJ  
 FILM SO-022

APERTURE 6.3  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.6195 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{0.74}{0.76} = 0.955 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{285}{486.31} \quad \text{@ center position}$$

$$D = 0.33$$

$$T_{cs} = 0.775$$

$$D = 0.34$$

$$T_{cs} = 0.784$$

$$D = 0.32$$

$$T_{cs} = 0.766$$

$$D = 0.35$$

$$T_{cs} = 0.793$$

$$D = 0.37$$

$$T_{cs} = 0.813$$

$$D = 0.35$$

$$T_{cs} = 0.793$$

$$D = 0.34$$

$$T_{cs} = 0.784$$

$$D = 0.36$$

$$T_{cs} = 0.803$$

$$D = 0.34$$

$$T_{cs} = 0.784$$

STATION 5

APERTURE 4.0

FILTER BB

SHUTTER 0.010

FILM SO-022

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.91$$

@ center position

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.768$$

@ center position

$$D = 2.17$$

$$T_{cs} = 0.763$$

$$D = 2.17$$

$$T_{cs} = 0.763$$

$$D = 2.16$$

$$T_{cs} = 0.761$$

$$D = 2.19$$

$$T_{cs} = 0.766$$

$$D = 2.20$$

$$T_{cs} = 0.768$$

$$D = 2.18$$

$$T_{cs} = 0.765$$

$$D = 2.17$$

$$T_{cs} = 0.763$$

$$D = 2.16$$

$$T_{cs} = 0.761$$

$$D = 2.15$$

$$T_{cs} = 0.759$$

STATION 5  
 FILTER BB  
 FILM SO-022

APERTURE 4.0  
 SHUTTER 0.005

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.63 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.78 \quad @ \text{ center position}$$

$$D = 1.70$$

$$T_{cs} = 0.769$$

$$D = 1.71$$

$$T_{cs} = 0.771$$

$$D = 1.70$$

$$T_{cs} = 0.769$$

$$D = 1.74$$

$$T_{cs} = 0.778$$

$$D = 1.75$$

$$T_{cs} = 0.78$$

$$D = 1.71$$

$$T_{cs} = 0.771$$

$$D = 1.71$$

$$T_{cs} = 0.771$$

$$D = 1.72$$

$$T_{cs} = 0.773$$

$$D = 1.70$$

$$T_{cs} = 0.769$$

STATION 5

APERTURE 4.0

FILTER BB

SHUTTER 0.0025

FILM SO-022

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = \boxed{\phantom{0.875}} 1.37 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.875 \boxed{\phantom{0.875}} @ \text{ center position}$$

$$D = 1.19$$

$$T_{cs} = 0.854$$

$$D = 1.22$$

$$T_{cs} = 0.865$$

$$D = 1.19$$

$$T_{cs} = 0.854$$

$$D = 1.22$$

$$T_{cs} = 0.865$$

$$D = 1.25$$

$$T_{cs} = 0.875$$

$$D = 1.22$$

$$T_{cs} = 0.865$$

$$D = 1.21$$

$$T_{cs} = 0.861$$

$$D = 1.22$$

$$T_{cs} = 0.865$$

$$D = 1.20$$

$$T_{cs} = 0.858$$

STATION 5  
 FILTER BB  
 FILM SO-022

APERTURE 5.6  
 SHUTTER 0.010

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.63$$

@ center position

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.78$$

@ center position

$$D = 1.71$$

$$T_{cs} = 0.773$$

$$D = 1.72$$

$$T_{cs} = 0.776$$

$$D = 1.69$$

$$T_{cs} = 0.792$$

$$D = 1.73$$

$$T_{cs} = 0.778$$

$$D = 1.74$$

$$T_{cs} = 0.78$$

$$D = 1.71$$

$$T_{cs} = 0.773$$

$$D = 1.71$$

$$T_{cs} = 0.773$$

$$D = 1.73$$

$$T_{cs} = 0.778$$

$$D = 1.70$$

$$T_{cs} = 0.771$$

STATION 5

APERTURE 5.6

FILTER BB

SHUTTER 0.005

FILM SO-022

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.36$$

@ center position

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.838$$

@ center position

$$D = 1.19$$

$$T_{cs} = 0.824$$

$$D = 1.20$$

$$T_{cs} = 0.828$$

$$D = 1.18$$

$$T_{cs} = 0.821$$

$$D = 1.22$$

$$T_{cs} = 0.835$$

$$D = 1.23$$

$$T_{cs} = 0.838$$

$$D = 1.20$$

$$T_{cs} = 0.828$$

$$D = 1.20$$

$$T_{cs} = 0.828$$

$$D = 1.21$$

$$T_{cs} = 0.831$$

$$D = 1.19$$

$$T_{cs} = 0.824$$

STATION 5

APERTURE 5.6

FILTER BB

SHUTTER 0.0025

FILM SO-022

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.08 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.879 \quad @ \text{ center position}$$

$$D = 0.71$$
$$T_{cs} = 0.856$$

$$D = 0.72$$
$$T_{cs} = 0.861$$

$$D = 0.71$$
$$T_{cs} = 0.856$$

$$D = 0.72$$
$$T_{cs} = 0.861$$

$$D = 0.75$$
$$T_{cs} = 0.879$$

$$D = 0.73$$
$$T_{cs} = 0.867$$

$$D = 0.72$$
$$T_{cs} = 0.861$$

$$D = 0.73$$
$$T_{cs} = 0.867$$

$$D = 0.71$$
$$T_{cs} = 0.856$$

STATION 5  
 FILTER BB  
 FILM SO-022

APERTURE 8.0  
 SHUTTER 0.010

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.36 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.855 \quad @ \text{ center position}$$

$$D = 1.17$$

$$T_{cs} = 0.837$$

$$D = 1.19$$

$$T_{cs} = 0.844$$

$$D = 1.17$$

$$T_{cs} = 0.837$$

$$D = 1.22$$

$$T_{cs} = 0.855$$

$$D = 1.22$$

$$T_{cs} = 0.855$$

$$D = 1.19$$

$$T_{cs} = 0.844$$

$$D = 1.18$$

$$T_{cs} = 0.841$$

$$D = 1.20$$

$$T_{cs} = 0.848$$

$$D = 1.18$$

$$T_{cs} = 0.841$$



STATION 5  
 FILTER BB  
 FILM SO-022

APERTURE 8.0  
 SHUTTER 0.005

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 1.07 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.878 \quad @ \text{ center position}$$

$$D = 0.70$$

$$T_{cs} = 0.86$$

$$D = 0.71$$

$$T_{cs} = 0.866$$

$$D = 0.69$$

$$T_{cs} = 0.854$$

$$D = 0.72$$

$$T_{cs} = 0.872$$

$$D = 0.73$$

$$T_{cs} = 0.878$$

$$D = 0.71$$

$$T_{cs} = 0.866$$

$$D = 0.70$$

$$T_{cs} = 0.86$$

$$D = 0.71$$

$$T_{cs} = 0.866$$

$$D = 0.70$$

$$T_{cs} = 0.86$$

STATION 5

APERTURE 8.0

FILTER BB

SHUTTER 0.0025

FILM SO-022

$$\int N_{\lambda} F_{\lambda} d_{\lambda} = 0.1014 \times 10^{-2}$$

$$E_{rel} = 0.79 \quad @ \text{ center position}$$

$$T_{cs} = \frac{4 f^2 E \int d_{\lambda}}{t \cdot 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}} = 0.921 \quad @ \text{ center position}$$

$$D = 0.38$$

$$T_{cs} = 0.898$$

$$D = 0.39$$

$$T_{cs} = 0.909$$

$$D = 0.38$$

$$T_{cs} = 0.898$$

$$D = 0.40$$

$$T_{cs} = 0.921$$

$$D = 0.40$$

$$T_{cs} = 0.921$$

$$D = 0.39$$

$$T_{cs} = 0.909$$

$$D = 0.38$$

$$T_{cs} = 0.898$$

$$D = 0.38$$

$$T_{cs} = 0.898$$

$$D = 0.37$$

$$T_{cs} = 0.886$$

STATION 6  
 FILTER GG + MM  
 FILM SO-022

APERTURE 4.0  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.8744 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.57}{1.55} = 1.047 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{125.9}{274.56} \text{ @ center position}$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.408$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.412$$

$$D = 1.57$$

$$T_{\text{cs}} = 0.397$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.417$$

$$D = 1.63$$

$$T_{\text{cs}} = 0.427$$

$$D = 1.60$$

$$T_{\text{cs}} = 0.412$$

$$D = 1.59$$

$$T_{\text{cs}} = 0.408$$

$$D = 1.61$$

$$T_{\text{cs}} = 0.417$$

$$D = 1.58$$

$$T_{\text{cs}} = 0.402$$

STATION 6

APERTURE 4.0

FILTER GG + MM

SHUTTER 0.005

FILM SO-022

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1146 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.32}{1.35} = 0.933 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{112.28}{179.9} \text{ @ center position}$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.571$$

$$D = 1.12$$

$$T_{\text{cs}} = 0.592$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.571$$

$$D = 1.12$$

$$T_{\text{cs}} = 0.592$$

$$D = 1.15$$

$$T_{\text{cs}} = 0.613$$

$$D = 1.11$$

$$T_{\text{cs}} = 0.585$$

$$D = 1.10$$

$$T_{\text{cs}} = 0.578$$

$$D = 1.12$$

$$T_{\text{cs}} = 0.592$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.571$$

STATION 6

APERTURE 4.0

FILTER GG + MM

SHUTTER 0.0025

FILM SO-022

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2291 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.05}{1.11} = 0.87 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{104.79}{179.84} \text{ @ center position}$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.595$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.609$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.595$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.609$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.624$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.609$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.595$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.609$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.595$$

STATION 6  
 FILTER GG + MM  
 FILM SO-022

APERTURE 5.6  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1147 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.31}{1.35} = 0.912 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{215.07}{360.16} \text{ @ center position}$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.552$$

$$D = 1.10$$

$$T_{\text{cs}} = 0.566$$

$$D = 1.08$$

$$T_{\text{cs}} = 0.552$$

$$D = 1.11$$

$$T_{\text{cs}} = 0.573$$

$$D = 1.13$$

$$T_{\text{cs}} = 0.587$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.559$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.559$$

$$D = 1.12$$

$$T_{\text{cs}} = 0.58$$

$$D = 1.09$$

$$T_{\text{cs}} = 0.559$$

STATION 6  
 FILTER GG + MM  
 FILM SO-022

APERTURE 5.6  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.2291 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.04}{1.11} = 0.85 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{200.72}{359.69} \text{ @ center position}$$

$$D = 0.66$$

$$T_{\text{cs}} = 0.569$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.576$$

$$D = 0.66$$

$$T_{\text{cs}} = 0.569$$

$$D = 0.68$$

$$T_{\text{cs}} = 0.583$$

$$D = 0.70$$

$$T_{\text{cs}} = 0.597$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.576$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.576$$

$$D = 0.69$$

$$T_{\text{cs}} = 0.59$$

$$D = 0.67$$

$$T_{\text{cs}} = 0.576$$

STATION 6  
 FILTER GG + MM  
 FILM SO-022

APERTURE 5.6  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7658 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{0.81}{0.79} = 1.047 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{246.94}{601.15} \text{ @ center position}$$

$$D = 0.40$$

$$T_{cs} = 0.556$$

$$D = 0.41$$

$$T_{cs} = 0.569$$

$$D = 0.40$$

$$T_{cs} = 0.556$$

$$D = 0.41$$

$$T_{cs} = 0.569$$

$$D = 0.42$$

$$T_{cs} = 0.583$$

$$D = 0.41$$

$$T_{cs} = 0.569$$

$$D = 0.41$$

$$T_{cs} = 0.569$$

$$D = 0.42$$

$$T_{cs} = 0.583$$

$$D = 0.41$$

$$T_{cs} = 0.569$$



STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.5837 \times 10^{-3}$$

$$\frac{E_{\text{measured}}}{E_{\text{sensitometry}}} = \frac{1.94}{1.77} = 1.48 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{136.26}{183.28} \text{ @ center position}$$

$$D = 2.19$$

$$T_{\text{cs}} = 0.596$$

$$D = 2.21$$

$$T_{\text{cs}} = 0.61$$

$$D = 2.18$$

$$T_{\text{cs}} = 0.588$$

$$D = 2.22$$

$$T_{\text{cs}} = 0.617$$

$$D = 2.24$$

$$T_{\text{cs}} = 0.632$$

$$D = 2.21$$

$$T_{\text{cs}} = 0.61$$

$$D = 2.20$$

$$T_{\text{cs}} = 0.603$$

$$D = 2.22$$

$$T_{\text{cs}} = 0.617$$

$$D = 2.18$$

$$T_{\text{cs}} = 0.588$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7828 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.66}{1.65} = 1.023 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{94.27}{122.89} \text{ @ center position}$$

$$D = 1.72$$

$$T_{\text{cs}} = 0.617$$

$$D = 1.75$$

$$T_{\text{cs}} = 0.639$$

$$D = 1.71$$

$$T_{\text{cs}} = 0.609$$

$$D = 1.78$$

$$T_{\text{cs}} = 0.662$$

$$D = 1.81$$

$$T_{\text{cs}} = 0.686$$

$$D = 1.76$$

$$T_{\text{cs}} = 0.646$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.624$$

$$D = 1.78$$

$$T_{\text{cs}} = 0.662$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.624$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 3.5  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1827 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.40}{1.35} = 1.12 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{103.36}{143.42} \text{ @ center position}$$

$$D = 1.22$$

$$T_{\text{cs}} = 0.644$$

$$D = 1.26$$

$$T_{\text{cs}} = 0.675$$

$$D = 1.23$$

$$T_{\text{cs}} = 0.652$$

$$D = 1.26$$

$$T_{\text{cs}} = 0.675$$

$$D = 1.30$$

$$T_{\text{cs}} = 0.709$$

$$D = 1.27$$

$$T_{\text{cs}} = 0.684$$

$$D = 1.23$$

$$T_{\text{cs}} = 0.652$$

$$D = 1.27$$

$$T_{\text{cs}} = 0.684$$

$$D = 1.24$$

$$T_{\text{cs}} = 0.66$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.7828 \times 10^{-3}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.65}{1.65} = 1.0 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{166.11}{245.79} \text{ @ center position}$$

$$D = 1.69$$

$$T_{\text{cs}} = 0.543$$

$$D = 1.71$$

$$T_{\text{cs}} = 0.557$$

$$D = 1.67$$

$$T_{\text{cs}} = 0.53$$

$$D = 1.74$$

$$T_{\text{cs}} = 0.576$$

$$D = 1.78$$

$$T_{\text{cs}} = 0.605$$

$$D = 1.72$$

$$T_{\text{cs}} = 0.563$$

$$D = 1.69$$

$$T_{\text{cs}} = 0.543$$

$$D = 1.73$$

$$T_{\text{cs}} = 0.57$$

$$D = 1.69$$

$$T_{\text{cs}} = 0.543$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1779 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.39}{1.35} = 1.096 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{182.14}{279.3} \text{ @ center position}$$

$$D = 1.18$$

$$T_{\text{cs}} = 0.575$$

$$D = 1.21$$

$$T_{\text{cs}} = 0.597$$

$$D = 1.18$$

$$T_{\text{cs}} = 0.575$$

$$D = 1.23$$

$$T_{\text{cs}} = 0.61$$

$$D = 1.27$$

$$T_{\text{cs}} = 0.641$$

$$D = 1.22$$

$$T_{\text{cs}} = 0.604$$

$$D = 1.20$$

$$T_{\text{cs}} = 0.55$$

$$D = 1.24$$

$$T_{\text{cs}} = 0.619$$

$$D = 1.19$$

$$T_{\text{cs}} = 0.582$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 4.7  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3321 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.11}{1.11} = 1.0 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{166.11}{260.6} \text{ @ center position}$$

$$D = 0.73$$

$$T_{\text{cs}} = 0.627$$

$$D = 0.76$$

$$T_{\text{cs}} = 0.649$$

$$D = 0.73$$

$$T_{\text{cs}} = 0.627$$

$$D = 0.77$$

$$T_{\text{cs}} = 0.657$$

$$D = 0.80$$

$$T_{\text{cs}} = 0.682$$

$$D = 0.76$$

$$T_{\text{cs}} = 0.649$$

$$D = 0.73$$

$$T_{\text{cs}} = 0.627$$

$$D = 0.77$$

$$T_{\text{cs}} = 0.657$$

$$D = 0.73$$

$$T_{\text{cs}} = 0.627$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 6.7  
 SHUTTER 0.010

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.1827 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.37}{1.35} = 1.047 \quad \text{@ center position}$$

$$T_{cs} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{353.48}{573.67} \text{ @ center position}$$

$$D = 1.17$$

$$T_{cs} = 0.55$$

$$D = 1.20$$

$$T_{cs} = 0.57$$

$$D = 1.17$$

$$T_{cs} = 0.55$$

$$D = 1.21$$

$$T_{cs} = 0.577$$

$$D = 1.25$$

$$T_{cs} = 0.606$$

$$D = 1.21$$

$$T_{cs} = 0.577$$

$$D = 1.17$$

$$T_{cs} = 0.55$$

$$D = 1.22$$

$$T_{cs} = 0.584$$

$$D = 1.18$$

$$T_{cs} = 0.56$$

STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 6.7  
 SHUTTER 0.005

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.3321 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{1.09}{1.11} = 0.955 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{322.38}{521.39} \text{ center position}$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.615$$

$$D = 0.74$$

$$T_{\text{cs}} = 0.638$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.615$$

$$D = 0.74$$

$$T_{\text{cs}} = 0.638$$

$$D = 0.77$$

$$T_{\text{cs}} = 0.661$$

$$D = 0.74$$

$$T_{\text{cs}} = 0.638$$

$$D = 0.72$$

$$T_{\text{cs}} = 0.623$$

$$D = 0.75$$

$$T_{\text{cs}} = 0.645$$

$$D = 0.71$$

$$T_{\text{cs}} = 0.615$$



STATION 6  
 FILTER AA  
 FILM SO-022

APERTURE 6.7  
 SHUTTER 0.0025

$$\int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda} = 0.8934 \times 10^{-2}$$

$$\frac{E_{\text{measure}}}{E_{\text{sensitometry}}} = \frac{0.85}{0.79} = 1.148 \quad \text{@ center position}$$

$$T_{\text{cs}} = \frac{4 f^2 1.88 \int d_{\lambda}}{t \pi 10^7 \int W_{\lambda} F_{\lambda} S_{\lambda} d_{\lambda}} \cdot \frac{E_m}{E_s} = \frac{387.59}{701.32} \text{ @ center position}$$

$$D = 0.42$$

$$T_{\text{cs}} = 0.731$$

$$D = 0.44$$

$$T_{\text{cs}} = 0.749$$

$$D = 0.43$$

$$T_{\text{cs}} = 0.739$$

$$D = 0.44$$

$$T_{\text{cs}} = 0.749$$

$$D = 0.46$$

$$T_{\text{cs}} = 0.739$$

$$D = 0.44$$

$$T_{\text{cs}} = 0.749$$

$$D = 0.42$$

$$T_{\text{cs}} = 0.731$$

$$D = 0.44$$

$$T_{\text{cs}} = 0.749$$

$$D = 0.42$$

$$T_{\text{cs}} = 0.731$$

## SECTION IV

### DISCUSSION

The results show large variance, over 100% in camera system transmission, between stations along with some discrepancies within some stations.

The  $T_{cs}$  data have been analyzed for systematic and calculation error and the following potential discrepancies are worthy of note.

1. Radiometric data: As stated in the Introduction, the method used to measure and record the calibrated light source is not clear. The acceptance angle of the radiometer was assumed to be  $51^\circ$ , as measured on a very similar PTD instrument. Any error in this angle affects  $T_{cs}$  proportionally by a  $\sin^2$  function. The positioning of the radiometer relative to the light source was unclear. For calculations here the instrument was assumed to be in contact with the source. Should that not be the case, the values for radiance could vary.
2. Spectral sensitometric data: A gamma correction factor was necessary for each density level of spectral sensitometric data. As described in Section II, the gamma of spectral sensitometric data and the gamma of the I-B sensitometer data were not the same, the possible cause being inherent in the relationship between the two instruments.

This factor is variable with density level depending on the relationship of the curves resulting from the two sets of data.

In the case of the SO-022, an alternate calculation method was possible because the 25 filter used for the sensitometric

data was very similar, if not the same as the BB camera filter. The gamma corrections for SO-022 were calculated on this basis. As observed in the D-log E curves, the curves cross at a density of 1.2.

The gamma corrections for the remainder of the films were estimated by assuming a "normal" relationship of a series of film-process curves at differing gammas.  $T_{cs}$  results would obviously show the result of any misplacement of these curves. Within 2424 data, however, the  $T_{cs}$  variability covers only a small range indicating the curve relationships are close.

3. Analytical Densities: The red, green, and blue densities read and recorded for the color films, 2443 and SO-356, represent incomplete separation of colors and a resultant error in  $T_{cs}$ .

Overlapping of dye layers, as shown below, causes densities of one layer to be affected by one or both of the remaining layers. For example, at 450nm in the illustration the blue density of the predominant yellow dye is affected by both the magenta and cyan dye layers.

Radiometric analysis requires the use of analytical densities where the dye concentrations are isolated and the influence of radiation on that dye layer may be determined.

$T_{cs}$  results shown here were obviously in error for this reason.

4. Camera apertures: The relationship of camera apertures for the S190A cameras is not clear. Nominal apertures were included in the calculations here and data indicates some error in the result. The experiment layout tends to indicate selection of camera apertures at one-half or full f-stop increments. If this is the case, 2424 film with a CC filter

at a nominal f/9.5 aperture and a shutter speed of 0.005 seconds produced a 1.73 density whereas a density of 1.79 was produced at f/13.0 with a shutter speed of 0.01 seconds. This represents an exposure difference of 11% which would be expected at f/13.0, because this is not a full f-stop less than f/9.5. If half stop detents were used on the lens and T-stops were calculated, f/9.5 and 13.0 could be erroneous values.

5. Camera shutter: There are instances where discrepancies result when all parameters are equal except shutter speed. For example, 2424 film with a CC filter at f/16 results in a density of 0.98 at a shutter speed of 0.005 seconds and 1.65 at a shutter speed of 0.01 seconds. This density difference represents an exposure difference of 2.2 times when the shutter speed change was only 2.0 times.
6. Gamma correction factor: The gamma correction factors are limited to the densities used for spectral sensitometric data. At either extreme of the D-log E curve this factor could be large and could produce large discrepancies. For example, 2424 film with a DD filter, 0.010 shutter, f/11 produces a density of 2.07 and a  $T_{cs}$  of 0.977 compared to  $T_{cs}$  results 18% lower for different densities and the same film-filter combination.
7. Exposure: In at least one case, 2443, the camera exposure placed some data on the extreme toe of the curve. Density differences may not change with an exposure change causing large  $T_{cs}$  discrepancies.

Results were checked for each black-and-white film-filter combination using the following method:

$$T_{cs} = \frac{A 4f^2 E \int d_{\lambda}}{t 10^7 \int N_{\lambda} F_{\lambda} d_{\lambda}}$$

where

$T_{cs}$  = camera system transmission

$A$  = filter factor determined as difference between camera and sensitometer filter integrated over useful range of 10nm intervals.

$f$  = camera aperture

$E$  = sensitometric exposure to produce measured density

$t$  = shutter speed

$\frac{\int d_{\lambda}}{\int N_{\lambda} F_{\lambda} d_{\lambda}}$  = light source and filter integrated over 10nm intervals

This check showed that the  $T_{cs}$  results were consistent relative to each film-filter combination.

## SECTION V

### CONCLUSIONS

The following are concluded from this task of determination of camera system transmission from available data:

- ° Extreme care must be taken that sensitometric and spectral sensitometric calibration films are processed the same as the camera films.
- ° It is essential to know how calibrations were made and to have ready access to the data. The prime example here is the calibrated light source.
- ° Filters used for camera exposures should be matched and made available for sensitometric exposures.
- °  $T_{cs}$  may be determined using the data available here. The results would leave the question of absolute  $T_{cs}$  unanswered but the results would be acceptable for relative  $T_{cs}$  which would normally be applicable to real data.
- ° Gamma correction curves should be derived for all appropriate film-filter combinations.
- ° Analytical densities are necessary for absolute radiometric calculations involving color films.

## SECTION VI

### RECOMMENDATIONS

These recommendations result from this task.

- ° Where radiometric determinations are to be made, careful consideration of processing the calibration and the data films must be made so that they are processed identically. Ideally, calibration exposures should be made on the data film as is the current case with S190A data.
- ° Data reduction of films requiring radiometric data should be coordinated closely such that adequate information and proper access to calibration and measuring instruments are available. These calibration instruments would include the I-B sensitometer, spectral sensitometer, and radiometer, as well as measuring instruments which might include densitometers and microdensitometers.
- ° Should absolute values for camera system transmission be required, the entire task, including lamp source calibration, film calibration, film processing, film reading and  $T_{CS}$  calculations should be closely coordinated, ideally within the same group.
- ° The capability should be developed for routinely supplying analytical densities for color films used in projects where radiometric determinations are to be made.

## APPENDICES



## APPENDIX A

### DENSITY VERSUS LOG E CURVES

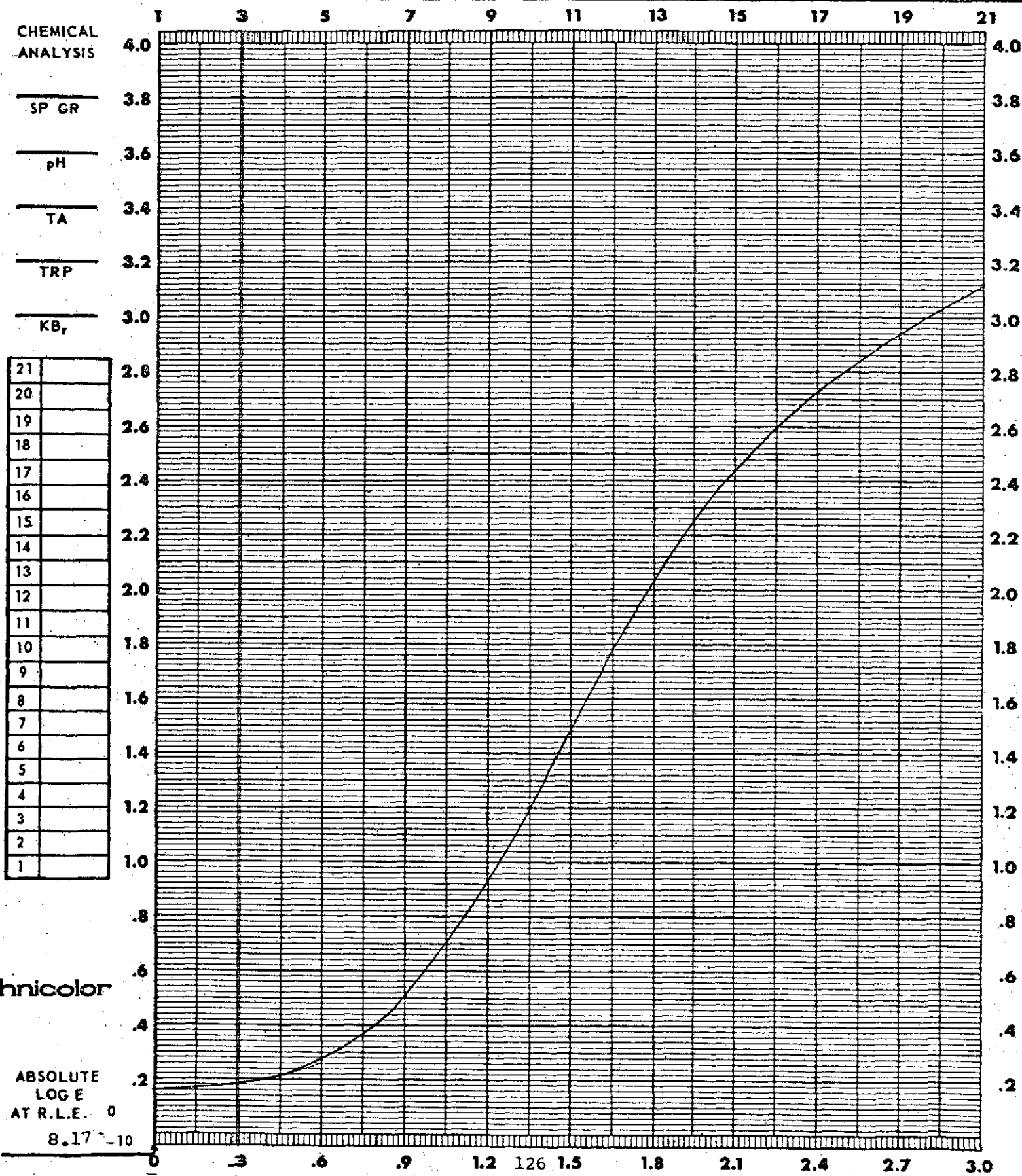
Density versus log exposure curves for the sensitometric exposures and for the gamma correction curves are included here.

The sensitometric curves are representative of the process gamma used for the camera exposed films. The gamma corrected curves are representative of the gamma displayed by the spectral sensitometric data.

772-150 EXPOSURE DATA 3010  
 SENSITOMETER I-B  
 ILLUMINANT 2850 °K  
 TIME 1/5 EC.  
 FILTER 5500 ±25

PROCESSING DATA  
 PROCESSOR Fultron #2  
 CHEMISTRY MX-819  
 SPEED \_\_\_\_\_ TANKS 9 FPM  
 TEMP °F 82 TIME \_\_\_\_\_

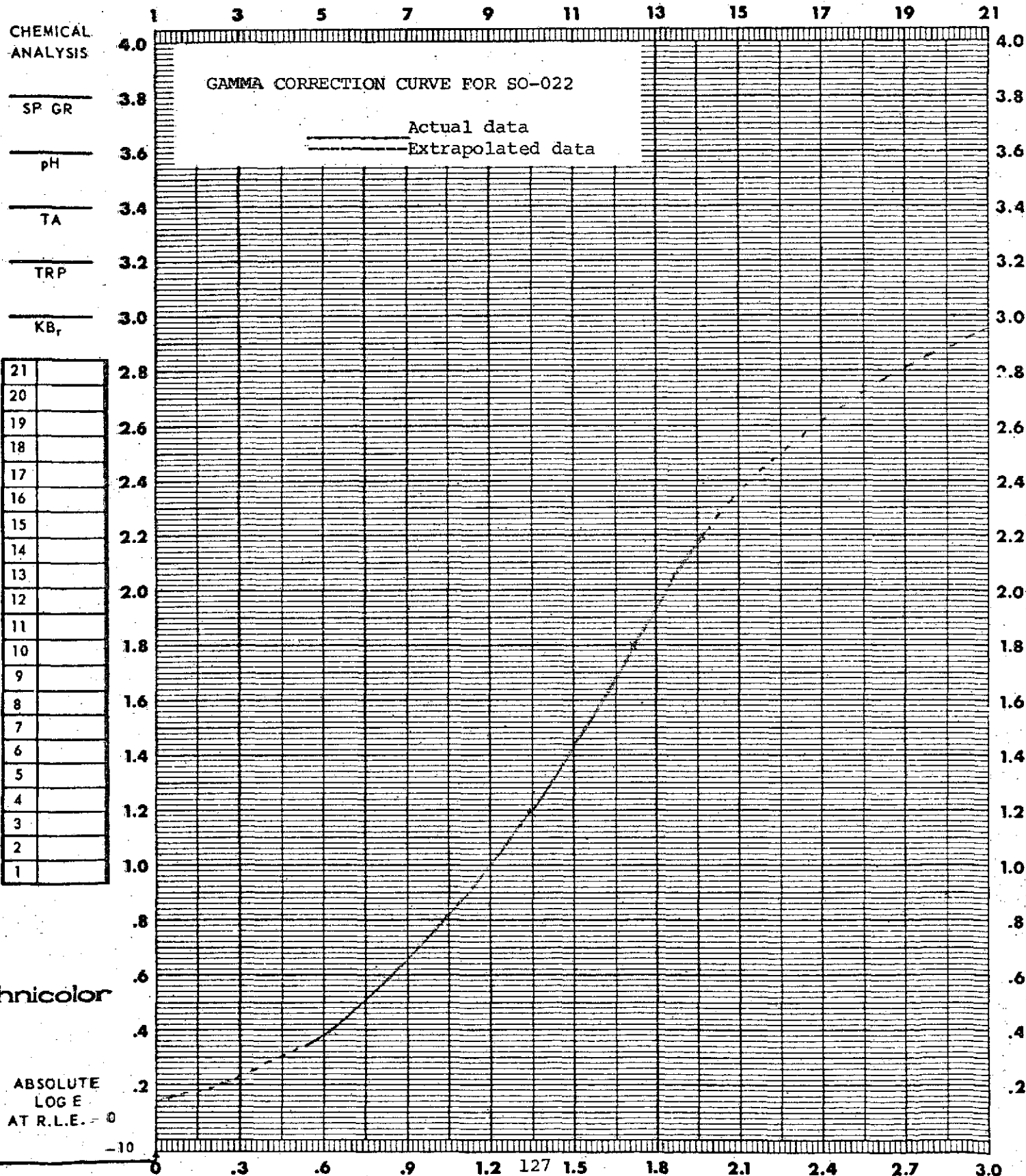
DENSITOMETRY  
 INSTRUMENT MacBeth SPEED ( ) \_\_\_\_\_  
 TYPE TD217DR D-MAX \_\_\_\_\_  
 APERTURE SIZE 2 MM GAMMA \_\_\_\_\_  
 FILTER Visual BASE + FOG \_\_\_\_\_



DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____



DATE 13 Jan 73 CONTROL # Station 2 TASK KSC KMOC 2 PREPARED BY Pre Sensi

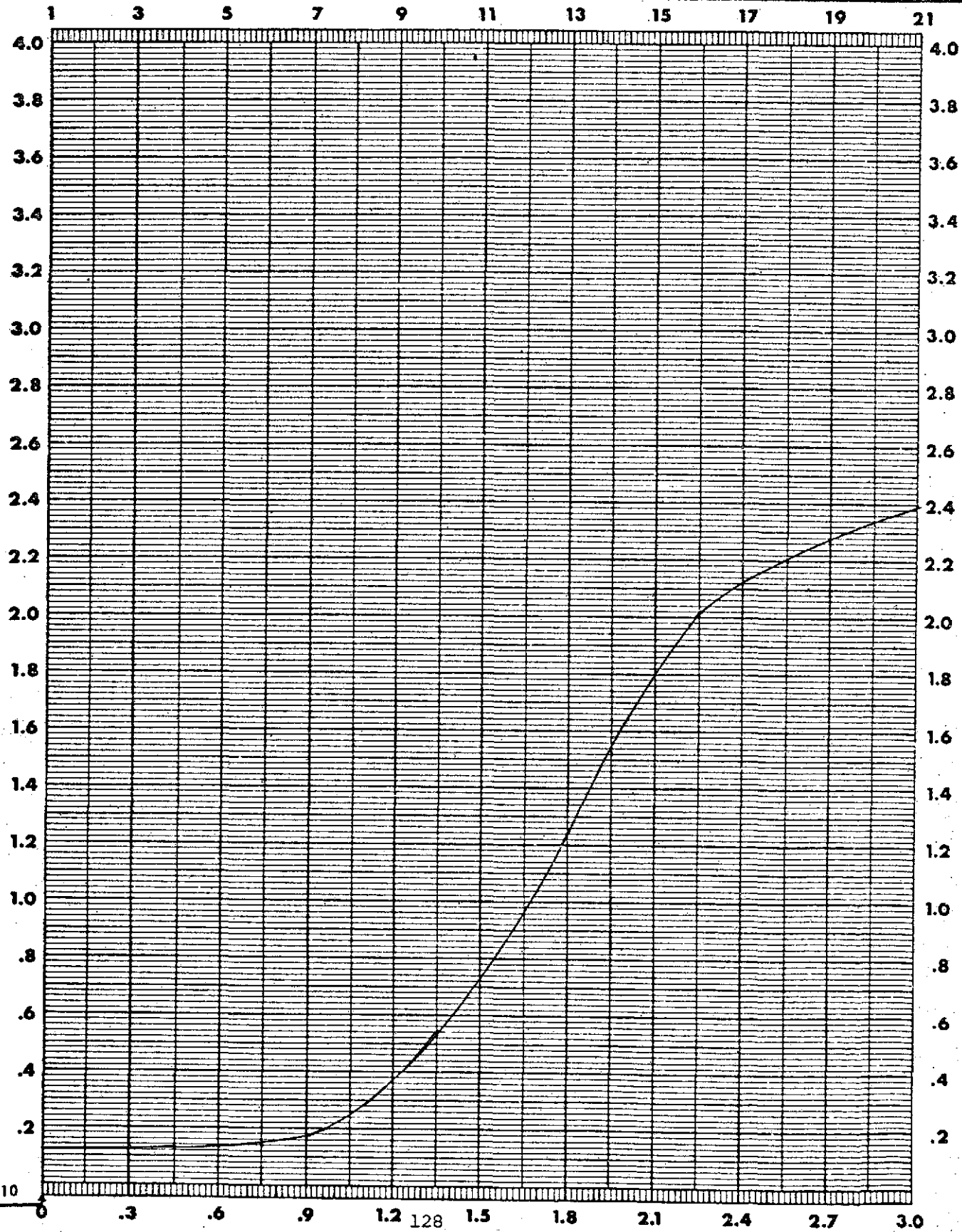
FILM 2424 EMULSION # 43-1 MFG  EXPIRATION DATE

772-150 EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	I-B 3010	PROCESSOR	Hi-Speed	INSTRUMENT	MacBeth
ILLUMINANT	2850 °K	CHEMISTRY	D-19	TYPE	TD217DR
TIME	1/50 SEC.	SPEED	TANKS 4 FPM	APERTURE SIZE	2 MM
FILTER	5500°K + 89B	TEMP °F	70 TIME	FILTER	Visual
				SPEED ( )	
				D-MAX	
				GAMMA	
				BASE + FOG	

CHEMICAL ANALYSIS

SP GR  
pH  
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TRP  
KB<sub>1</sub>

21	
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2	
1	



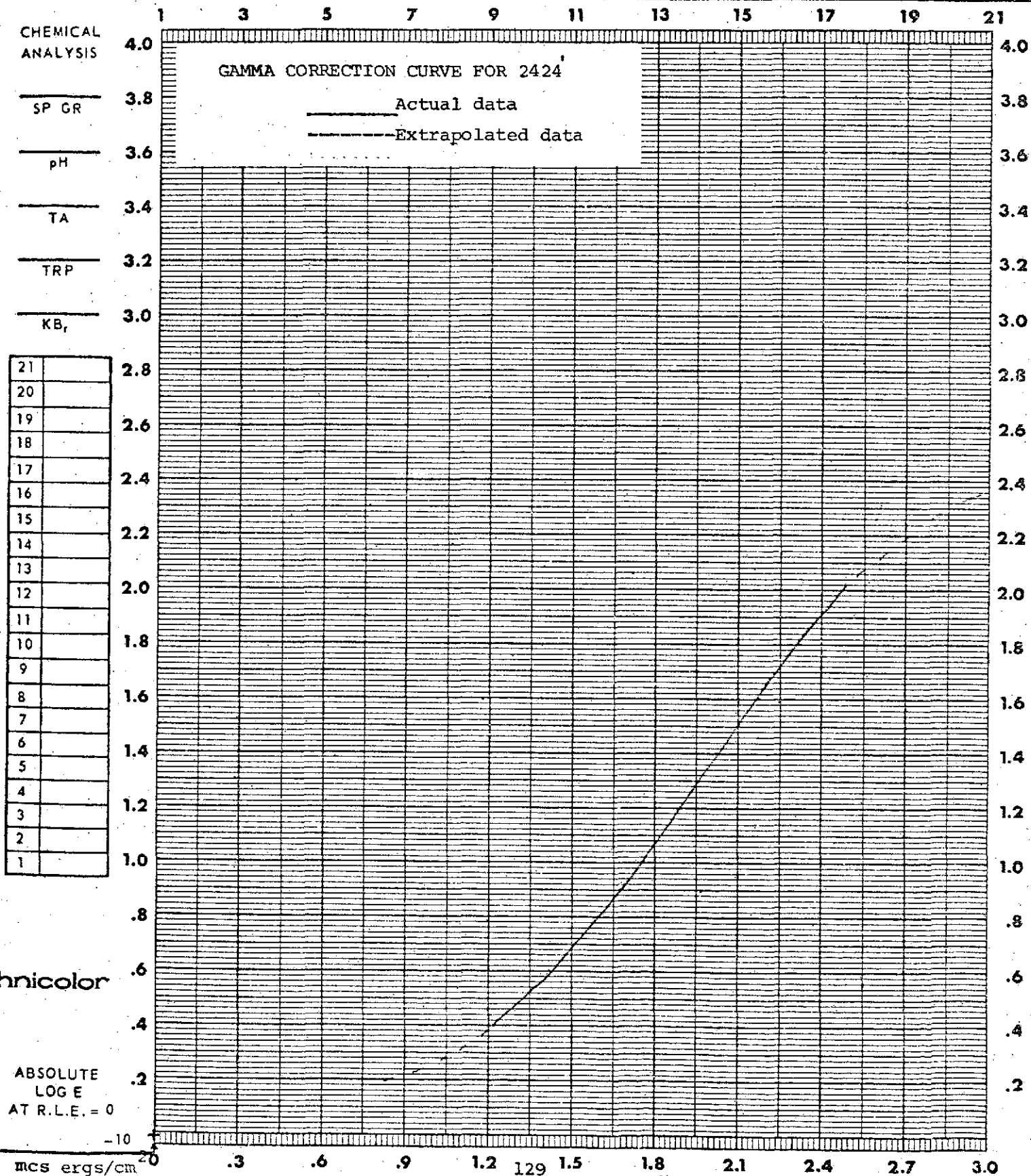
Technicolor

ABSOLUTE LOG E  
AT R.L.E. 0  
7.17 -10

DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____



DATE 13 Jan 73 CONTROL # Station 4 TASK KSC KM002 PREPARED BY Pre Sensi

FILM SO-356 EMULSION # 16-4 MFG  EXPIRATION DATE

772-150 EXPOSURE DATA 3010		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	I-B	PROCESSOR	Houston	INSTRUMENT	MacBeth
ILLUMINANT	2850 °K	CHEMISTRY	ME-4	TYPE	TD217DR
TIME	1/5 SEC.	SPEED	TANKS 15 FPM	APERTURE SIZE	2 MM
FILTER	5500	TEMP °F	98 TIME	FILTER	Visual
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG

CHEMICAL ANALYSIS

SP GR

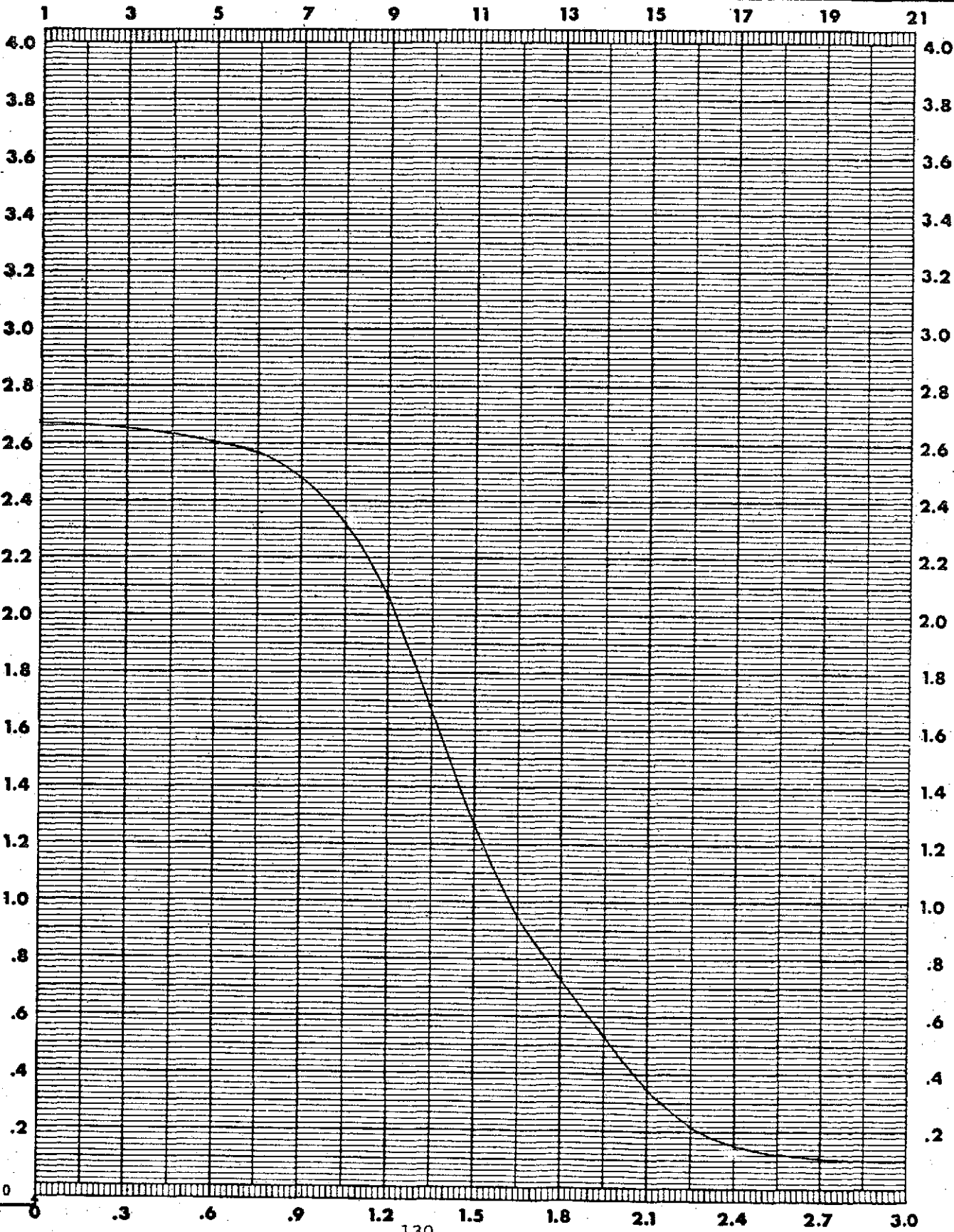
pH

TA

TRP

KB<sub>r</sub>

21	
20	
19	
18	
17	
16	
15	
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13	
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11	
10	
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8	
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6	
5	
4	
3	
2	
1	



Technicolor

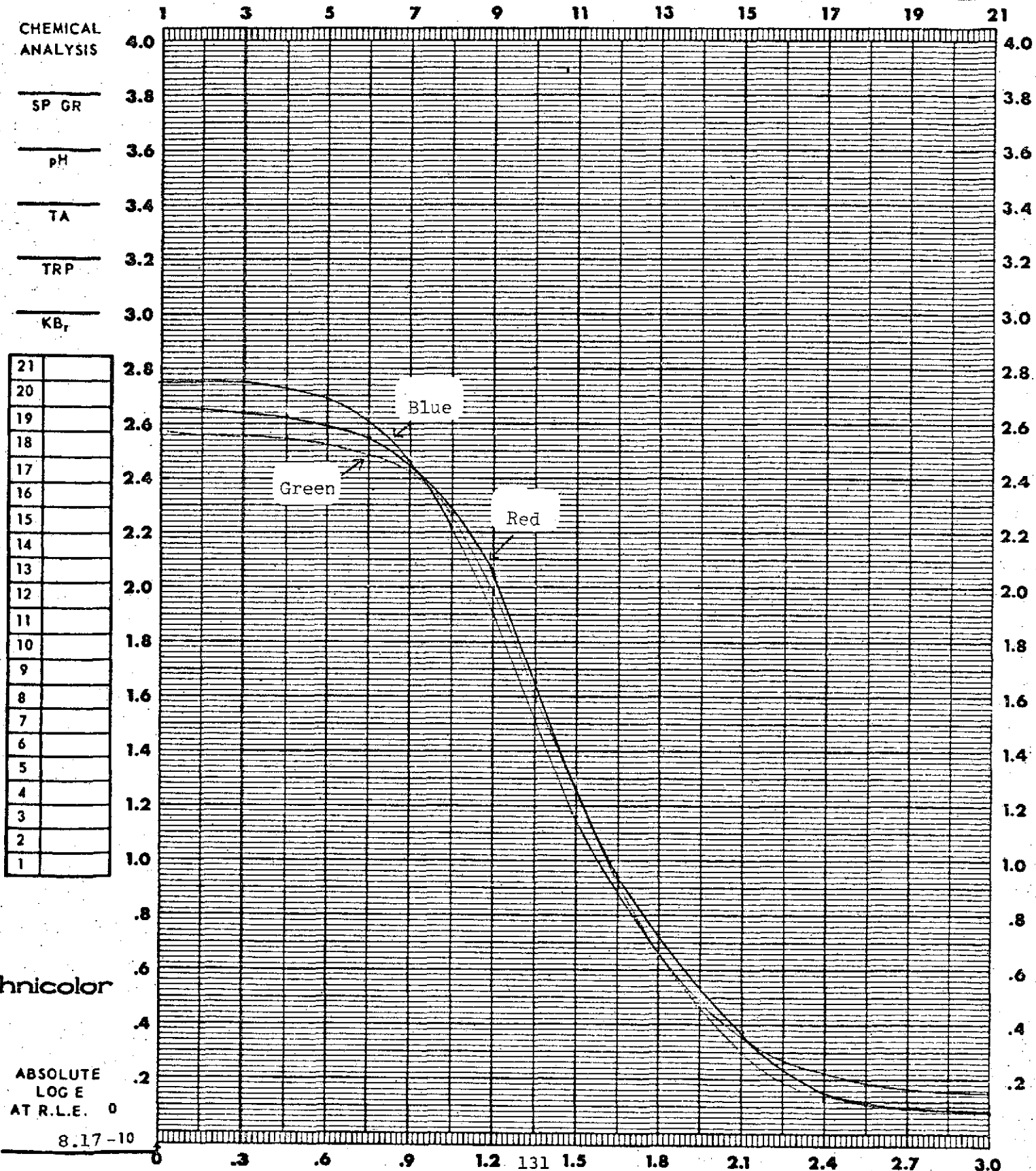
ABSOLUTE LOG E AT R.L.E. 0

8.17 -10

DATE 13 Jan 73 CONTROL # Station 4 TASK KSC KM002 PREPARED BY Pre Sensi.

FILM SO-356 EMULSION # 16-4 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

772-150 EXPOSURE DATA 3010		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>1-B</u>	PROCESSOR	<u>Houston</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>ME-4</u>	TYPE	<u>TD217DR</u>
TIME	<u>1/5</u> SEC.	SPEED	<u>TANKS 15</u> FPM	APERTURE SIZE	<u>2</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>98</u>	TIME	<u>Status A</u>
				SPEED (	<u>)</u>
				D-MAX	<u></u>
				GAMMA	<u></u>
				BASE + FOG	<u></u>

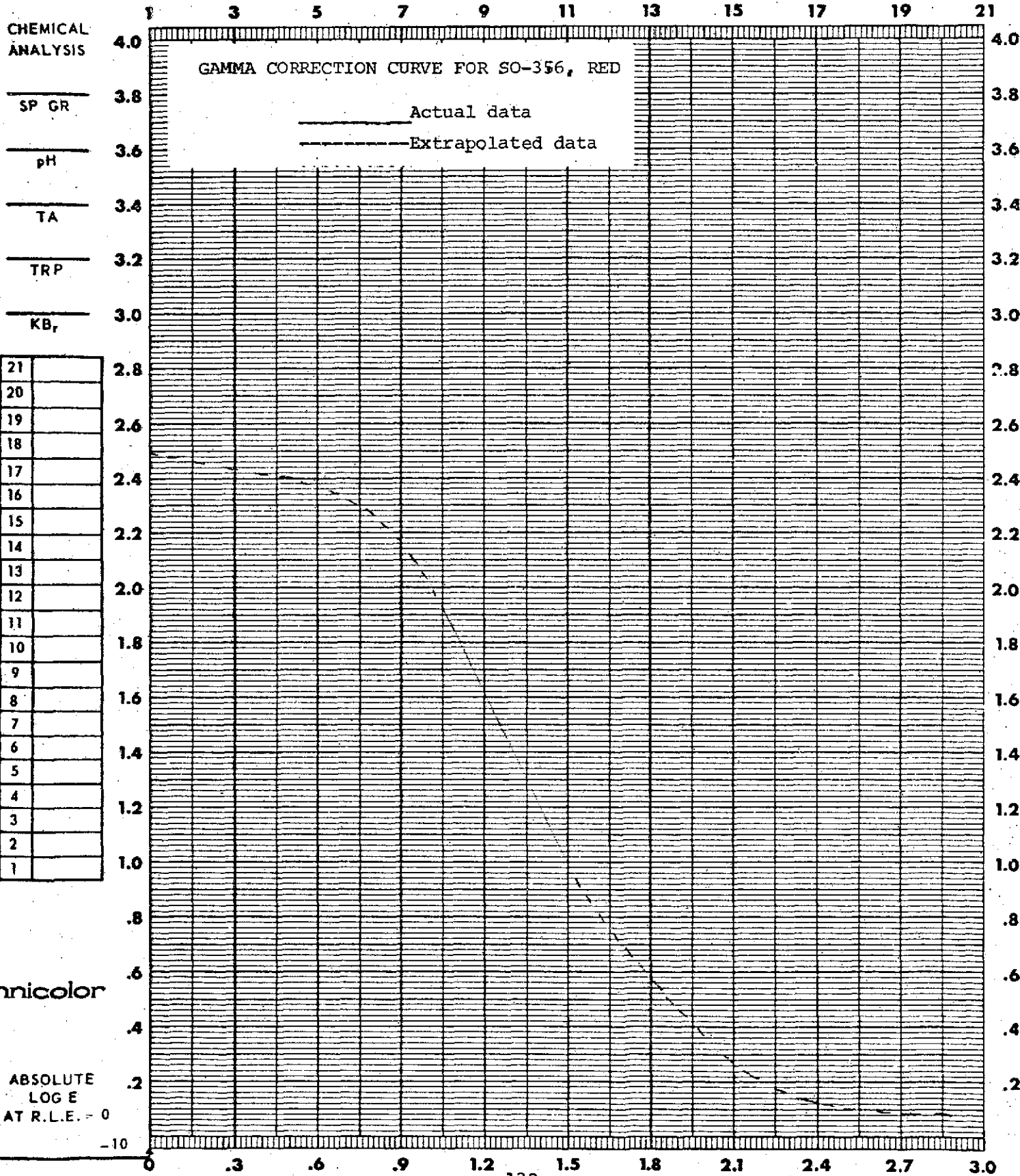




DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____

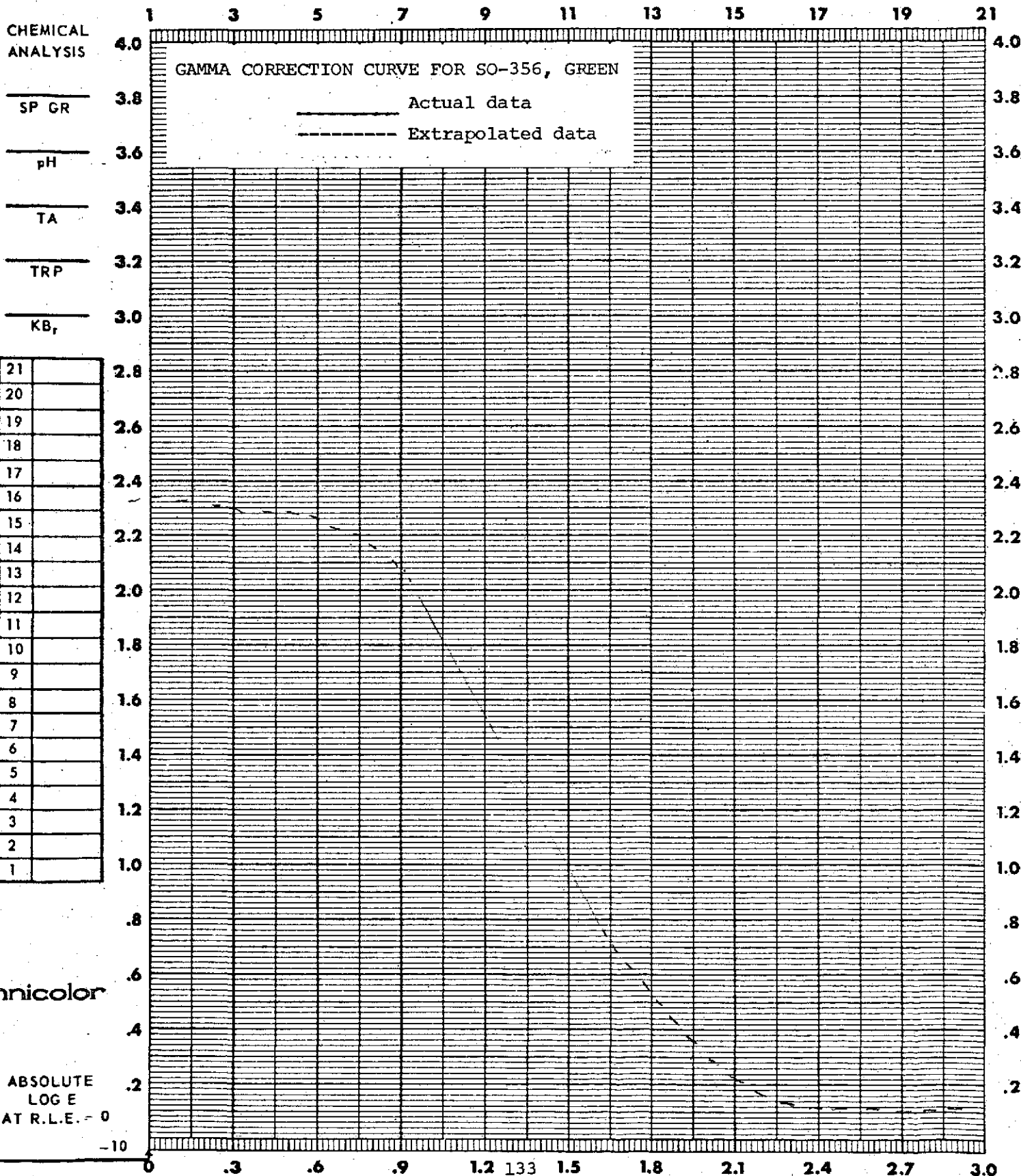




DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

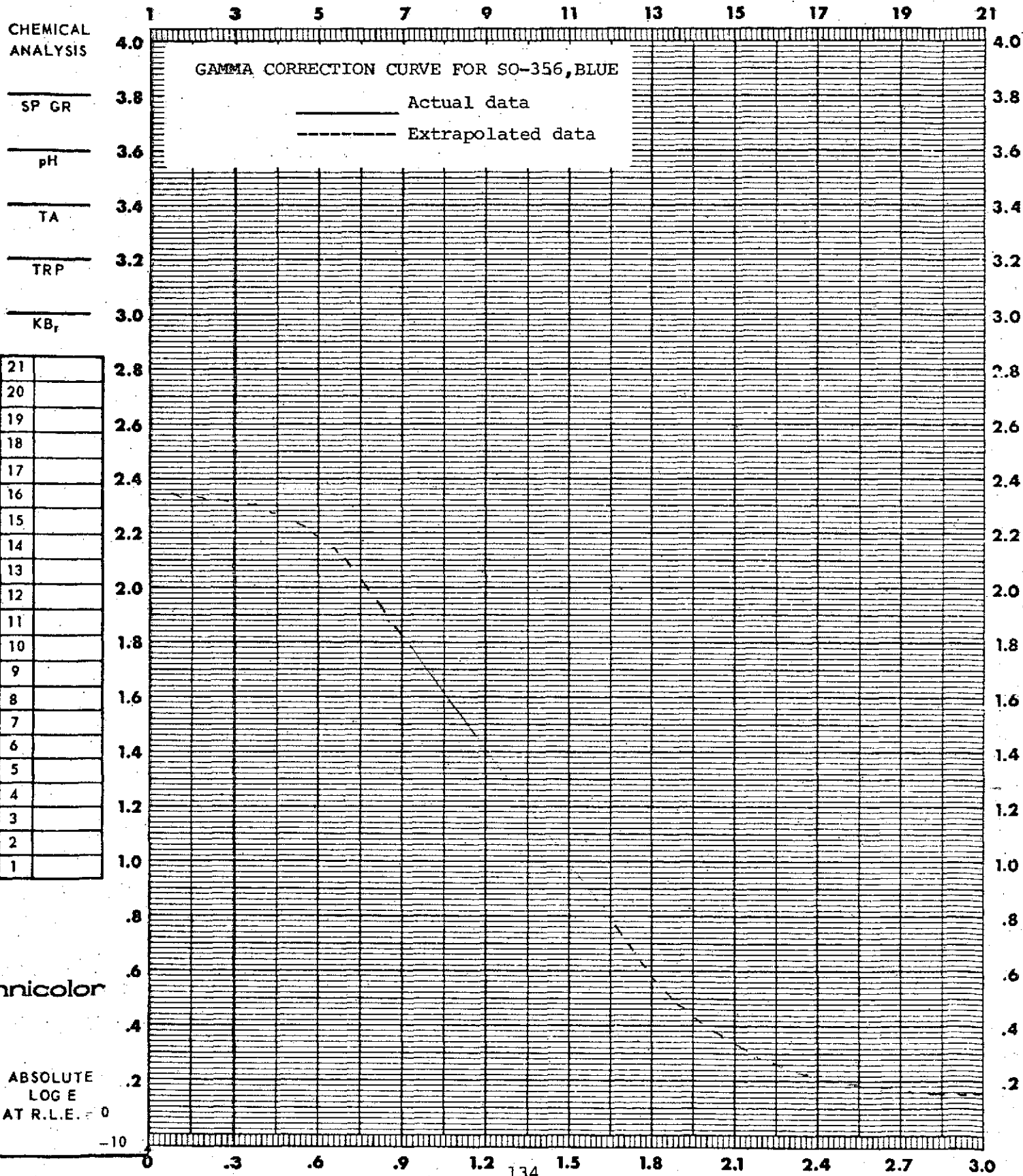
EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____



DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

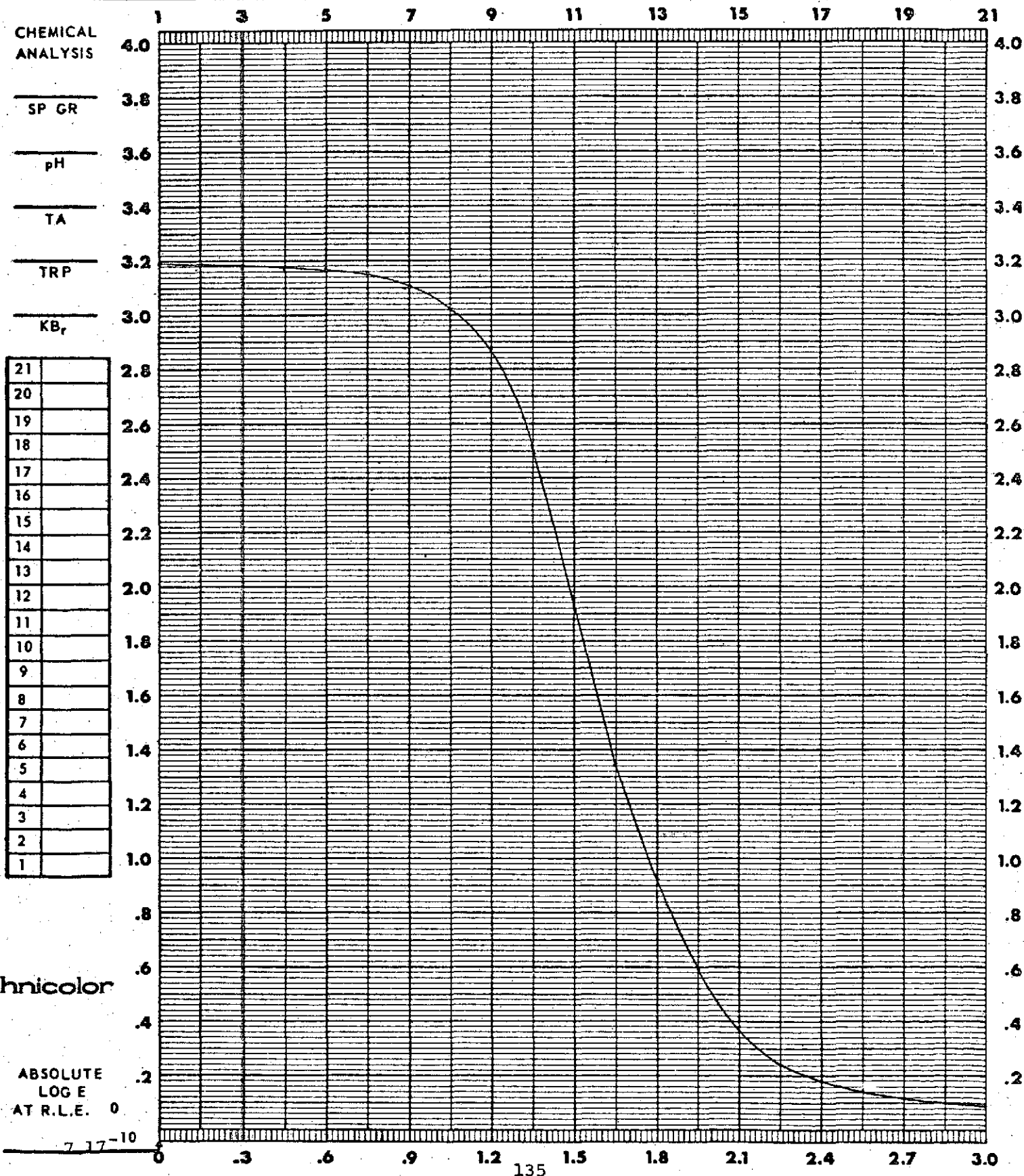
EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____



DATE 13 Jan 73 CONTROL # Station 3 TASK KSC KM002 PREPARED BY Pre=Sensi

FILM 2443 EMULSION # 116-2 MFG                      EXPIRATION DATE                     

772-150 EXPOSURE DATA 3010		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	I-B	PROCESSOR	1811 #2	INSTRUMENT	MacBeth
ILLUMINANT	2850 °K	CHEMISTRY	EA-5	TYPE	TD217DR
TIME	1/50 SEC.	SPEED	TANKS 5 FPM	APERTURE SIZE	2 MM
FILTER	5500+W12	TEMP °F	104.5 TIME	FILTER	Visual
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG

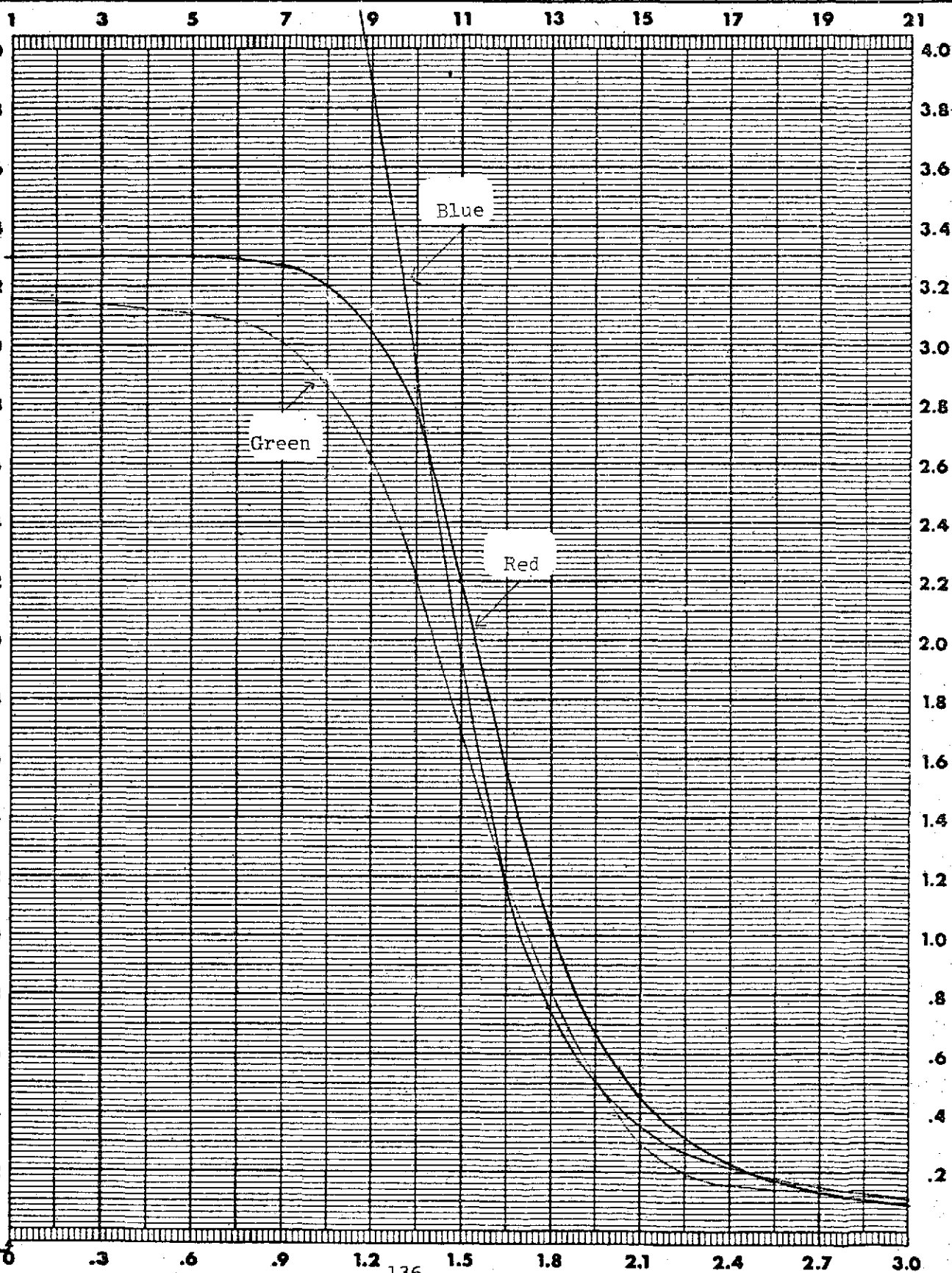


772-15 EXPOSURE DATA 3010		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER <u>I-B</u>		PROCESSOR <u>1811 #2</u>		INSTRUMENT <u>MacBeth</u>	
ILLUMINANT <u>2850 °K</u>		CHEMISTRY <u>EA-5</u>		TYPE <u>TD217DR</u>	
TIME <u>1/50</u> SEC.		SPEED <u>5</u> TANKS <u>5</u> FPM		APERTURE SIZE <u>2</u> MM	
FILTER <u>5500 + W12</u>		TEMP °F <u>104</u> TIME _____		FILTER <u>Status A</u>	
				SPEED ( ) _____	
				D-MAX _____	
				GAMMA _____	
				BASE + FOG _____	

CHEMICAL ANALYSIS

SP GR \_\_\_\_\_  
 pH \_\_\_\_\_  
 TA \_\_\_\_\_  
 TRP \_\_\_\_\_  
 KB<sub>r</sub> \_\_\_\_\_

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Technicolor

ABSOLUTE LOG E  
 AT R.L.E. 0

7.17 -10

DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____

CHEMICAL ANALYSIS

SP GR \_\_\_\_\_

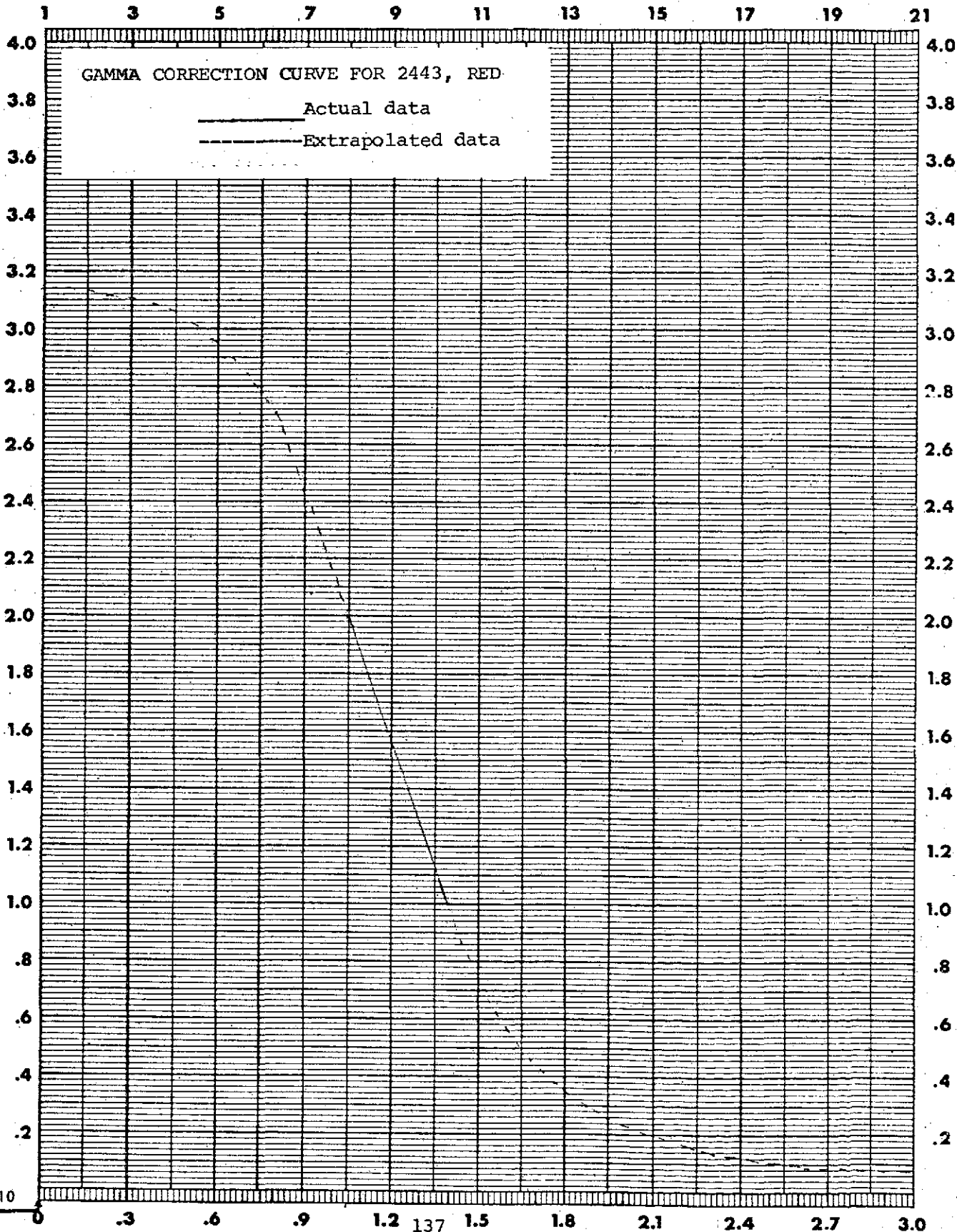
pH \_\_\_\_\_

TA \_\_\_\_\_

TRP \_\_\_\_\_

KB<sub>r</sub> \_\_\_\_\_

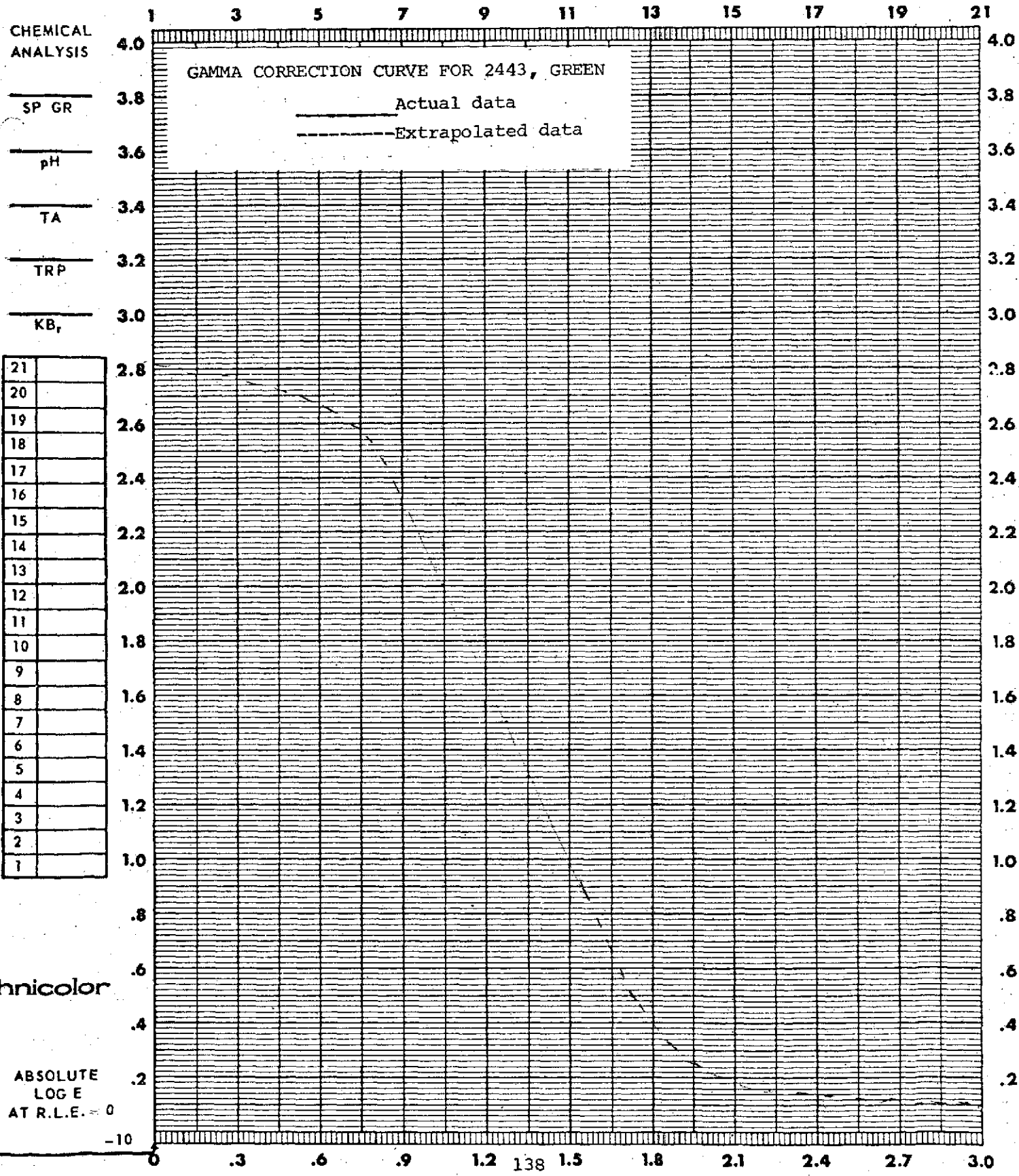
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DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____



DATE \_\_\_\_\_ CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM \_\_\_\_\_ EMULSION # \_\_\_\_\_ MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER _____		PROCESSOR _____		INSTRUMENT _____	SPEED ( ) _____
ILLUMINANT _____ °K		CHEMISTRY _____		TYPE _____	D-MAX _____
TIME _____ SEC.		SPEED _____ TANKS _____ FPM		APERTURE SIZE _____ MM	GAMMA _____
FILTER _____		TEMP °F _____ TIME _____		FILTER _____	BASE + FOG _____

CHEMICAL ANALYSIS

SP GR \_\_\_\_\_

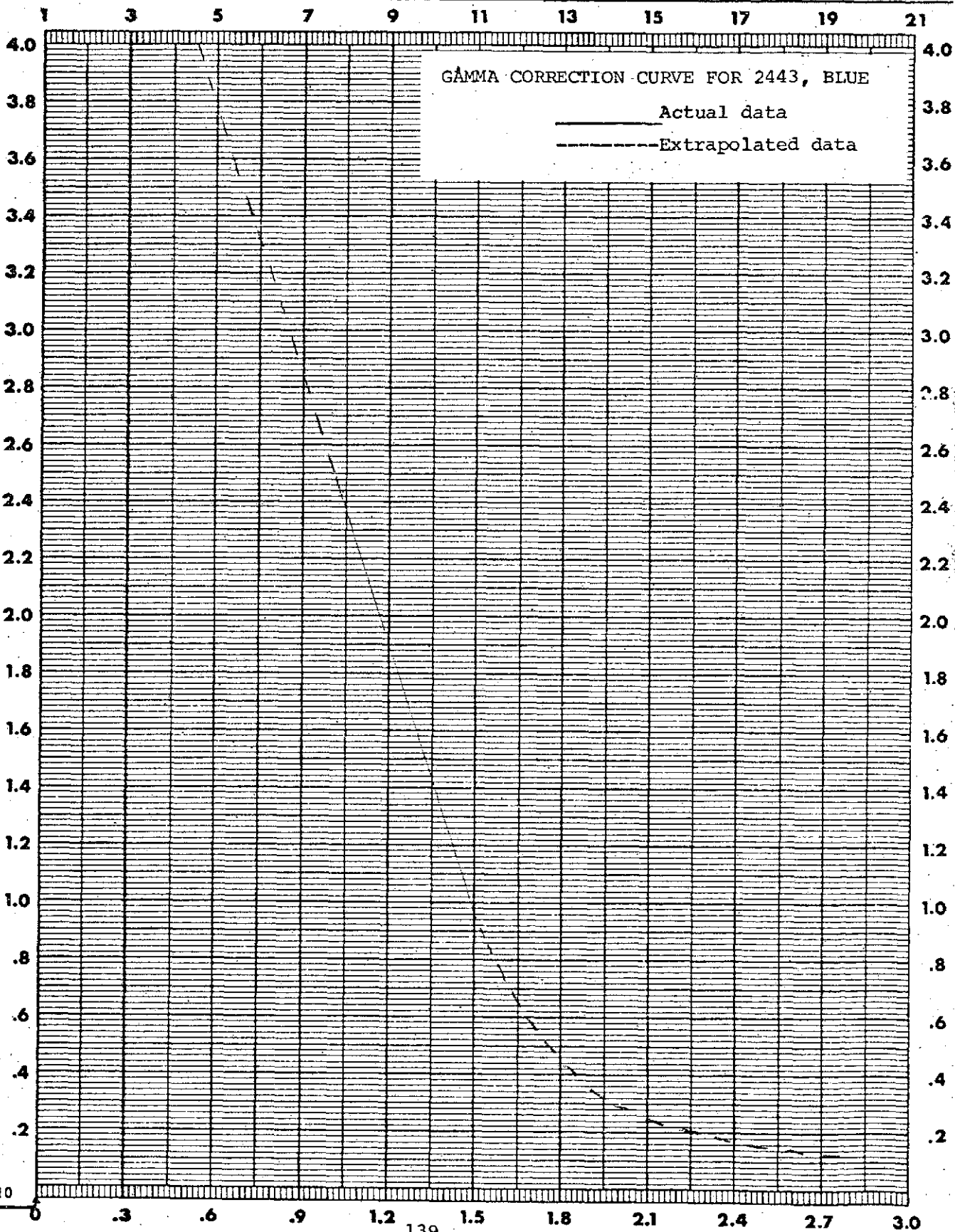
pH \_\_\_\_\_

TA \_\_\_\_\_

TRP \_\_\_\_\_

KB<sub>r</sub> \_\_\_\_\_

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3	
2	
1	



## APPENDIX B

### SPECTRAL SENSITOMETRIC DATA

This data, absolute spectral sensitivity in  $\text{cm}^2/\text{erg}$  at specified density levels for each film type, was used to calculate the camera system lens transmission.

A  $10^{-7}$  conversion factor is necessary to  $\text{ergs}/\text{cm}^2$  to watt-seconds/ $\text{cm}^2$  to make the units consistent with the radiometric data for the calibrated light source.



### EXPOSURE DATA:

PROCESSING DATA:

## DENSITOMETRY:

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)[illegible]

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 1 OF 4

DATE: 3/1/72 FACILITY: PTD TASK: EK2424 PREPARED BY: GOODING  
FILM: 2424 EMULSION NUMBER: 43-1 MFG: EM EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0100 SECONDS  
FILTRATION: REP. 1: DAYLIGHT + 1.00 ND FILTER CONTROL NO.: REP. 1:

PROCESSING DATA:

PROCESSOR: HI SPEED CHEMISTRY: D-19 TEMPERATURE: 70  
TRANSPORT SPEED: 4 REMARKS: K5C SCRATCH TEST

DENSITOMETRY:

INSTRUMENT: MACBETH TYPE: TD#217  
APERTURE SIZE: 2 MM FILTER: VISUAL DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute Spectral Sensitivity) (cm<sup>2</sup>/ERG)

GROSS	DENSITY	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00
WAVELENGTH										
350										
360	1.6752	1.4061	1.1296	.....	.....	.....	.....	.....	.....	.....
370	1.7684	1.5351	1.3259	1.1197	.9358	.7578	.....	.....	.....	.....
380	1.8278	1.6107	1.4182	1.2352	1.0697	.9197	.7773	.6307	.4387	
390	1.8521	1.6897	1.5134	1.2947	1.1330	1.0066	.8827	.7427	.5685	
400	1.8558	1.6857	1.5053	1.3527	1.2063	1.0719	.9477	.8190	.6566	
410	1.8272	1.6521	1.4869	1.3346	1.2020	1.0804	.9598	.8312	.6785	
420	1.8279	1.6523	1.4946	1.3485	1.2198	1.1035	.9880	.8609	.7018	
430	1.8427	1.6614	1.5116	1.3779	1.2562	1.1431	1.0301	.9056	.7455	
440	1.8243	1.6591	1.5107	1.3679	1.2391	1.1254	1.0160	.8965	.7364	
450	1.8181	1.6319	1.4795	1.3456	1.2259	1.1162	1.0076	.8882	.7317	
460	1.7385	1.5716	1.4263	1.2936	1.1725	1.0591	.9449	.8190	.6606	
470	1.6195	1.4282	1.2757	1.1510	1.0447	.9437	.8371	.7102	.5416	
480	1.4788	1.2976	1.1403	.9909	.8623	.7553	.6565	.5506	.4035	
490	1.2941	1.0996	.9379	.7973	.6707	.5511	.4334	.3091	.1536	
500	1.0682	.8453	.6569	.4936	.3516	.2206	.0935	-.0401	-.2102	
510	.9006	.6522	.4526	.2741	.1219	-.0135	-.1509	-.3081	-.4061	
520	.8551	.5773	.3526	.1730	.0232	-.1181	-.2663	-.4004	-.4011	
530	.8703	.6147	.4086	.2324	.0872	-.0455	-.1859	-.3531	-.3998	
540	.9272	.6876	.4979	.3316	.1855	.0544	-.0774	-.2326	-.3943	
550	.9963	.7740	.5839	.4206	.2766	.1455	.0186	-.1229	-.3330	
560	1.0303	.8223	.6387	.4763	.3329	.2003	.0727	-.0636	-.2517	
570	1.0774	.8623	.6820	.5235	.3819	.2493	.1192	-.0184	-.1975	
580	1.0961	.8906	.7147	.5568	.4160	.2843	.1536	.0143	-.1643	
590	1.1314	.9164	.7381	.5844	.4496	.3225	.1925	.0476	-.1425	
600	1.1455	.9457	.7704	.6122	.4735	.3447	.2154	.0745	-.1080	
610	1.1511	.9406	.7467	.5812	.4420	.3133	.1856	.0464	-.1421	
620	1.1442	.9206	.7255	.5655	.4286	.3014	.1756	.0379	-.1489	
630	1.1756	.9605	.7871	.6341	.4921	.3574	.2274	.0914	-.0858	
640	1.1939	.9942	.8033	.6384	.5005	.3726	.2444	.1030	-.0928	
650	1.2343	1.0150	.8170	.6568	.5230	.3971	.2681	.1229	-.0808	
660	1.2159	1.0101	.8180	.6523	.5097	.3789	.2520	.1133	-.0853	
670	1.2206	1.0119	.8320	.6756	.5366	.4056	.2755	.1322	-.0751	
680	1.2422	1.0312	.8499	.6895	.5457	.4111	.2802	.1413	-.0429	
690	1.2577	1.0538	.8788	.7230	.5860	.4566	.3276	.1894	.0134	

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 1 OF 4

DATE: 3/28/73 FACILITY: JSC-P50 TASK: 50-356 RED PREPARED BY: PERRY  
FILM: 50356 RED EMULSION NUMBER: 16-4 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0333 SECONDS  
FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:

PROCESSOR: HOUSTON CHEMISTRY: ME-4 TEMPERATURE: 98  
TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH TYPE: TD-217  
APERTURE SIZE: 2 MM FILTER: RED-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10(ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50

\*\*\*  
WAVELENGTH

350		
360		
370		
380		
390		
400		
410		
420	-1.3711	-1.0952
430	-1.0942	-.8349
440	-1.1501	-.8888
450	-1.2359	-.9785
460	-1.3301	-1.0715
470	-1.4431	-1.1970
480	-1.4667	-1.2135
490	-1.4616	-1.2089
500	-1.4693	-1.2011
510	-1.3777	-1.1057
520	-1.2844	-1.0308
530	-1.1732	-.9316
540	-1.1026	-.8398
550	-1.0338	-.7616
560	-.8298	-.5668
570	-.6718	-.4091
580	-.5260	-.2581
590	-.3607	-.1191
600	-.2184	.0297
610	-.1020	.1664
620	.0417	.3606
630	.2969	.5179
640	.4769	.7095
650	.5355	.7843
660	.3212	.5847
670	-.2034	.0590
680	-.5911	-.3134
690	-1.2896	-.9115

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 2 OF 4

DATE: 3/28/73 FACILITY: JSC-P50 TASK: 50-356 RED PREPARED BY: PERRY  
FILM: 50356 RED EMULSION NUMBER: 14-4 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0333 SECONDS  
FILTRATION: REP. 11 DAYLIGHT CONTROL NO.: REP. 11

PROCESSING DATA:

PROCESSOR: HOUSTON CHEMISTRY: ME-4 TEMPERATURE: 98  
TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH TYPE: TD-217  
APERTURE SIZE: 2 MM FILTER: RED-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50

WAVELENGTH

700  
710  
720  
730  
740  
750  
760  
770  
780  
790  
800  
810  
820  
830  
840  
850  
860  
870  
880  
890  
900  
910  
920  
930  
940  
950  
960  
970  
980  
990  
1000

144

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 4 OF 4

DATE: 3/28/73 FACILITY: JSC-PSO

TASK: 50-356 GRN PREPARED BY: PERRY

FILM: 50356 GRN EMULSION NUMBER: 16-4

MFG: EK

EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001

EXPOSURE TIME: .0333 SECONDS

FILTRATION: REP. 1: DAYLIGHT

CONTROL NO.: REP. 1:

PROCESSING DATA:

PROCESSOR: HOUSTON

CHEMISTRY: ME-4

TEMPERATURE: 90

TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH

TYPE: TD8217

APERTURE SIZE: 2 MM

FILTER: GREEN-STATUS A

DENSITY CALIBRATION PERFORMED: NO

LOG10 ABSOLUTE SPECTRAL SENSITIVITY, (CM<sup>2</sup>/ERG)

GROSS DENSITY	1.00	1.50
WAVELENGTH		
350		
360		
370		
380		
390		
400	*****	-1.4205
410	-1.5919	-1.2439
420	-1.0440	-.7617
430	-.8345	-.5678
440	-.9024	-.6104
450	-.9698	-.6944
460	-1.0233	-.7619
470	-1.0590	-.7613
480	-.9437	-.6703
490	-.7403	-.4619
500	-.5387	-.2828
510	-.3605	-.0821
520	-.1577	.1246
530	.0790	.3551
540	.2505	.5285
550	.3536	.6173
560	.0858	.3528
570	.0708	.3185
580	-.1102	.1498
590	-1.1279	-.8839
600	*****	-1.6648
610		
620		
630		
640		
650		
660		
670		
680		
690		

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 2 OF 4

DATE: 3/28/73 FACILITY: JSC-PSO TASK: SO-356 GRN PREPARED BY: PERRY  
FILM: 50356 GRN EMULSION NUMBER: 14-4 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0333 SECONDS  
FILTRATION: REP. 1: DAYLIGHT

CONTROL NO.: REP. 1:

PROCESSING DATA:

PROCESSOR: HOUSTON CHEMISTRY: ME-4 TEMPERATURE: 98  
TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH TYPE: TD-217  
APERTURE SIZE: 2 MM FILTER: GREEN STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CH-2/ERG)

GROSS DENSITY 1.00 1.50

\*\*\*  
WAVELENGTH

700  
710  
720  
730  
740  
750  
760  
770  
780  
790  
800  
810  
820  
830  
840  
850  
860  
870  
880  
890  
900  
910  
920  
930  
940  
950  
960  
970  
980  
990  
1000

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 1 OF 4

DATE: 3/28/73 FACILITY: JSC-P50 TASK: 50-356 BL PREPARED BY: PERRY  
FILM: 50356 BL EMULSION NUMBER: 16-4 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0333 SECONDS  
FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:

PROCESSOR: HOUSTON CHEMISTRY: ME-4 TEMPERATURE: 98  
TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH TYPE: TD-217  
APERTURE SIZE: 2 MM FILTER: BLUE-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50

\*\*\*  
WAVELENGTH

350  
360  
370  
380  
390  
400  
410  
420  
430  
440  
450  
460  
470  
480  
490  
500  
510  
520  
530  
540  
550  
560  
570  
580  
590  
600  
610  
620  
630  
640  
650  
660  
670  
680  
690

\*\*\*\*\* -1.1968  
-1.0067 -1.6919  
-1.6612 -1.2035  
-1.0450 -1.2986  
-1.0000 -1.4767  
-1.0311 -1.3983  
-1.1000 -1.2951  
-1.1885 -1.1671  
-1.3298 -1.0297  
-1.3592 -1.0227  
-1.3824 -1.0802  
-1.5011 -1.2138  
-1.7157 -1.4096  
-1.0807 -1.7220  
-1.5462 -1.1090  
\*\*\*\*\* -1.7075

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 2 OF 4

DATE: 3/28/73 FACILITY: JSC-P50 TASK: 50-356 BL PREPARED BY: PERRY  
FILM: 50356 BL EMULSION NUMBER: 16-4 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 1B SPECTROSENSITOMETER MODEL 7001

EXPOSURE TIME: .0333 SECONDS

FILTRATION: REP. 1: DAYLIGHT

CONTROL NO.: REP. 11

PROCESSING DATA:

PROCESSOR: HOUSTON CHEMISTRY: ME-9 TEMPERATURE: 98

TRANSPORT SPEED: 15 FPM REMARKS:

DENSITOMETRY:

INSTRUMENT: MACBETH

TYPE: TDB217

APERTURE SIZE: 2 MM

FILTER: BLUE-STATUS A

DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50

\*\*\*  
WAVELENGTH

700

710

720

730

740

750

760

770

780

790

800

810

820

830

840

850

860

870

880

890

900

910

920

930

940

950

960

970

980

990

1000

188



\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 1 OF 9

DATE: 4/3/73 FACILITY: JSC-PSO TASK: 2443 RED PREPARED BY: PERRY  
 FILM: 2443 RED EMULSION NUMBER: 116-2 NEG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0100 SECONDS  
 FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:  
 PROCESSOR: VMAT 1811 CHEMISTRY: EA-5 TEMPERATURE: 110  
 TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: TD-217  
 APERTURE SIZE: 2 MM FILTER: RED-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY	1.00	1.50	2.00
***			
WAVELENGTH			
350	*****	.5613	.8118
360	.8205	1.0934	1.2811
370	1.1147	1.3298	1.4884
380	1.2473	1.4610	1.6302
390	1.2034	1.4646	1.7566
400	1.2442	1.4245	1.9444
410	1.1826	1.4100	1.6441
420	1.1729	1.6422	1.8126
430	1.2162	1.4449	1.6098
440	1.0984	1.3828	1.7422
450	1.0377	1.2386	1.4126
460	.9128	1.0846	1.2339
470	.7360	.9203	1.0722
480	.5059	.6779	.8278
490	.3286	.5119	.6578
500	.1113	.2862	.4344
510	-.0478	.1329	.2717
520	-.1059	.0766	.2238
530	-.1200	.0749	.2250
540	-.1426	.0555	.2112
550	-.2193	-.0275	.1326
560	-.1877	.0043	.1602
570	-.1183	.0701	.2215
580	-.0134	.1289	.3303
590	.1038	.2655	.4007
600	.1658	.3225	.4599
610	.2182	.3718	.5073
620	.2523	.4024	.5378
630	.2474	.3964	.5321
640	.2783	.4296	.5715
650	.3111	.4616	.6062
660	.3463	.4978	.6410
670	.3726	.5311	.6613
680	.3648	.5275	.6520
690	.3917	.5680	.6937

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 2 OF 9

DATE: 4/3/73 FACILITY: JSC-P50 TASK: 2443 RED PREPARED BY: PERRY  
 FILM: 2443 RED EMULSION NUMBER: 114-2 HFG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0100 SECONDS  
 FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 11

PROCESSING DATA:  
 PROCESSOR: VMAT 1811 CHEMISTRY: EA-5 TEMPERATURE: 110  
 TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: TD-217  
 APERTURE SIZE: 2 MM FILTER: RED-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CM\*\*2/ERG)

GROSS DENSITY	1.00	1.50	2.00
***			
WAVELENGTH			
700	.4561	.6426	.7810
710	.4956	.6899	.8325
720	.5493	.7311	.8660
730	.5316	.7193	.8579
740	.5179	.7052	.8402
750	.4481	.6389	.7771
760	.3982	.6183	.7558
770	.3536	.5724	.7173
780	.3747	.5901	.7370
790	.3950	.6164	.7589
800	.4103	.6254	.7718
810	.3954	.6114	.7628
820	.3808	.6120	.7565
830	.3304	.5614	.7197
840	.2847	.5062	.6636
850	.2624	.4965	.6454
860	.2607	.4914	.6536
870	.2282	.4658	.6212
880	.0462	.2992	.4687
890	.3896	.1204	.0605
900	.8337	.5365	.3501
910			
920			
930			
940			
950			
960			
970			
980			
990			
1000			

DATE: 4/3/73 FACILITY: JSC-P50 TASK: 2443 GREEN PREPARED BY: PERRY  
 FILM: 2443 GREEN EMULSION NUMBER: 114-2 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION (B SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0100 SECONDS  
 FILTRATION: REP. 11 DAYLIGHT CONTROL NO.: REP. 11

PROCESSING DATA:  
 PROCESSOR: VHAT 1811 CHEMISTRY: EA-5 TEMPERATURE: 110  
 TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: TD-217  
 APERTURE SIZE: 2 MM FILTER: GREEN-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.60 2.00

\*\*\*  
 WAVELENGTH

350			
360			
370			
380	*****	.3870	.0685
390	.1703	.0818	.3396
400	.1285	.3698	.6252
410	.2249	.4642	.7134
420	.3574	.5992	.8337
430	.4638	.6912	.9189
440	.5133	.7570	1.0019
450	.5447	.7682	.9862
460	.5082	.7203	.9312
470	.3878	.6070	.8106
480	.2945	.5104	.7232
490	.1743	.3952	.6107
500	.0235	.1936	.4076
510	.1543	.0688	.2870
520	.2361	.0067	.2248
530	.2672	.0282	.2008
540	.1963	.0065	.2162
550	.1519	.0111	.2151
560	.0161	.2034	.4165
570	.1275	.3415	.5606
580	.3051	.5176	.7280
590	.4130	.6110	.7938
600	.4069	.6198	.8214
610	.4345	.7039	.9248
620	.3980	.7541	.9891
630	.6145	.9447	1.1602
640	.7170	1.1350	1.3805
650	.8140	1.2414	1.5374
660	.4793	.7548	.9901
670	.1297	.1944	.4122
680	.10115	.5326	.1367
690	.10411	.5730	.1562

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DATE: 4/3/73 FACILITY: JSC-P50 TASK: 2443 GREEN PREPARED BY: PERRY  
 FILM: 2443 GREEN EMULSION NUMBER: 116-2 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0100 SECONDS  
 FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:  
 PROCESSOR: VMAT 1811 CHEMISTRY: EA-5 TEMPERATURE: 110  
 TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: TD-217  
 APERTURE SIZE: 2 MM FILTER: GREEN-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50 2.00

\*\*\*

WAVELENGTH

700 ..... -0.8436

710

720

730

740

750

760

770

780

790

800

810

820

830

840

850

860

870

880

890

900

910

920

930

940

950

960

970

980

990

1000

DATE: 4/3/73 FACILITY: JSC-P50 TASK: 2443 BLUE PREPARED BY: PERRY  
FILM: 2443-BLUE EMULSION NUMBER: 116-2 NEG: EK EXPIRATION DATE:

EXPOSURE DATA:  
INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
EXPOSURE TIME: .0100-SECONDS  
FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:  
PROCESSOR: VMAT-101-1 CHEMISTRY: EA-5 TEMPERATURE: 110  
TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
INSTRUMENT: MACBETH TYPE: TD-217  
APERTURE SIZE: 2 MM FILTER: BLUE-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY	1.00	1.50	2.00
***			
WAVELENGTH			
350			
360			
370	*****	-.1923	.1479
380	.0367	.3902	.6498
390	.4053	.7066	.8765
400	.6953	.9027	1.0536
410	.7708	.9667	1.1135
420	.8584	1.0485	1.2009
430	.9122	1.1376	1.3137
440	.9441	1.1204	1.2901
450	.9832	1.1602	1.2913
460	.9560	1.1172	1.2447
470	.8972	1.0746	1.2021
480	.8748	1.0562	1.1855
490	.8203	1.0202	1.1592
500	.7718	.9834	1.1244
510	.8330	1.0380	1.1629
520	.9178	1.1417	1.3006
530	.9808	1.1769	1.3166
540	1.0313	1.2211	1.3775
550	1.0346	1.2173	1.3880
560	1.0250	1.2145	1.4170
570	1.0013	1.1813	1.3579
580	.9221	1.1128	1.2494
590	.3538	.5082	.6235
600	-.1672	-.0050	.1234
610	-.8322	-.5883	-.3919
620	*****	-.11364	
630			
640			
650			
660			
670			
680			
690			

DATE: 4/3/73 FACILITY: JSC-PSO TASK: 2443 BLUE PREPARED BY: PERRY  
 FILM: 2443 BLUE EMULSION NUMBER: 116-2 HFG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0100 SECONDS  
 FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:  
 PROCESSOR: VMAT-1811 CHEMISTRY: EA-5 TEMPERATURE: 110  
 TRANSPORT SPEED: 7 FPM REMARKS:

DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: TD-217  
 APERTURE SIZE: 2 MM FILTER: BLUE-STATUS A DENSITY CALIBRATION PERFORMED: NO

LOG10 (ABSOLUTE SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS DENSITY 1.00 1.50 2.00

\*\*\*  
 WAVELENGTH

700  
 710  
 720  
 730  
 740  
 750  
 760  
 770  
 780  
 790  
 800  
 810  
 820  
 830  
 840  
 850  
 860  
 870  
 880  
 890  
 900  
 910  
 920  
 930  
 940  
 950  
 960  
 970  
 980  
 990  
 1000

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 1 OF 4

DATE: 3/13/73 FACILITY: JSC-PSO

TASK: EK 50-022 PREPARED BY: PERRY

FILM: 50-022

EMULSION NUMBER: 1-1

HFG: EK

EXPIRATION DATE:

EXPOSURE DATA:

INSTRUMENT: DATA CORPORATION 10 SPECTROSENSITOMETER MODEL 7001

EXPOSURE TIME: .0333 SECONDS

FILTRATION: REP. 1: DAYLIGHT

CONTROL NO. 1 REP. 1:

PROCESSING DATA:

PROCESSOR: FULTRON

CHEMISTRY: MX-B19

TEMPERATURE: 82 F

TRANSPORT SPEED: 9 FPM REMARKS: 50-022

DENSITOMETRY:

INSTRUMENT: MACBETH

TYPE: 10-217

APERTURE SIZE: 2 MM

FILTER:

VISUAL

DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute Spectral Sensitivity) (cm<sup>2</sup>/erg)

GROSS DENSITY	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00
WAVELENGTH									
350	.9407	.5751	.2184	.0398	.2559	.0534	.1382	.3204	.1053
360	1.2481	.9292	.6757	.4622	.5347	.3843	.2299	.0674	.0172
370	1.3867	1.1275	.8936	.6956	.5895	.4475	.3119	.1731	.1185
380	1.4908	1.1771	.9352	.7464	.5895	.4475	.3119	.1731	.1064
390	1.5279	1.2107	.9424	.7424	.5934	.4758	.3706	.2612	.0500
400	1.4962	1.1821	.9604	.7849	.6373	.5045	.3764	.2461	.0386
410	1.4590	1.1316	.9067	.7211	.5684	.4398	.3194	.1940	.0511
420	1.4475	1.1245	.8952	.7108	.5552	.4234	.3025	.1790	.0364
430	1.4484	1.1057	.8907	.7240	.5779	.4450	.3193	.1917	.0115
440	1.4154	1.0898	.8578	.6884	.5473	.4210	.3017	.1787	.0890
450	1.3631	.9699	.7825	.6282	.4912	.3666	.2482	.1263	.02259
460	1.3064	.8831	.6880	.5335	.4001	.2801	.1647	.0451	.02813
470	1.1375	.7747	.5925	.4371	.2965	.1647	.0366	.00923	.03433
480	.9309	.6926	.5220	.3718	.2318	.0983	.0291	.01526	.03544
490	.8615	.6123	.4236	.2686	.1350	.0130	.01028	.02186	.03020
500	.8191	.5803	.4082	.2658	.1396	.0204	.00980	.02209	.02688
510	.8247	.6110	.4453	.3026	.1771	.0605	.00544	.01735	.02399
520	.8939	.6592	.4873	.3380	.2081	.0902	.0244	.01422	.01904
530	.9686	.6896	.5282	.3869	.2553	.1288	.0054	.01161	.01487
540	1.0268	.7637	.5860	.4389	.3067	.1843	.0654	.00568	.01221
550	1.0678	.7909	.6134	.4659	.3308	.2083	.0943	.00208	.00691
560	1.0931	.8283	.6378	.4983	.3698	.2473	.1282	.0076	.00588
570	1.0825	.8628	.6646	.5258	.4041	.2886	.1745	.0574	.00919
580	1.0931	.8701	.6839	.5446	.4177	.2964	.1794	.0637	.01333
590	1.0873	.8314	.6547	.5180	.3874	.2639	.1484	.0338	.01750
600	1.0626	.7560	.6063	.4697	.3392	.2191	.1068	.0070	.02084
610	1.0289	.7260	.5755	.4371	.3075	.1869	.0702	.00485	.02418
620	.9874	.6992	.5516	.4340	.3085	.1405	.0054	.01097	.02298
630	.9394	.6533	.4996	.3649	.2292	.0931	.0273	.01337	.02288
640	.8863	.6581	.4906	.3457	.2195	.1045	.0047	.01133	.01538
650	.8693	.6514	.4956	.3615	.2356	.1160	.0026	.01091	.00801
660	1.0121	.7384	.5794	.4360	.3116	.2000	.0905	.0256	.00287
670	1.1393	.8029	.6488	.5175	.3958	.2800	.1661	.0482	.01334
680	1.1248	.8590	.6871	.5549	.4329	.3182	.2079	.0954	
690	1.0446	.7630	.5963	.4572	.3321	.2155	.1022	.0122	

\*\*\* SPECTRAL SENSITIVITY REPORT \*\*\* PAGE 2 OF 4

DATE: 3/13/73 FACILITY: JSC-PSO TASK: EK 50-022 PREPARED BY: PERRY  
 FILM: 50-022 EMULSION NUMBER: 1-1 MFG: EK EXPIRATION DATE:

EXPOSURE DATA:  
 INSTRUMENT: DATA CORPORATION 18 SPECTROSENSITOMETER MODEL 7001  
 EXPOSURE TIME: .0333 SECONDS  
 FILTRATION: REP. 1: DAYLIGHT CONTROL NO.: REP. 1:

PROCESSING DATA:  
 PROCESSOR: FULTRON CHEMISTRY: MX-819 TEMPERATURE: 82 F  
 TRANSPORT SPEED: 9 FPM REMARKS: 50-022  
 DENSITOMETRY:  
 INSTRUMENT: MACBETH TYPE: ID#217  
 APERTURE SIZE: 2 MM FILTER: VISUAL DENSITY CALIBRATION PERFORMED: NO

LOG10(Absolute SPECTRAL SENSITIVITY) (CM<sup>2</sup>/ERG)

GROSS	DENSITY	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00
WAVELENGTH										
700		.4554	.2206	.0496	-.0869	-.2108	-.3334	-.4581	-.5861	-.7232
710		-.1580	-.3835	-.5819	-.7658	-.9478	-1.1207	-1.2787	-1.4421	-1.6533
720		-.7869	-1.2297	-1.5458	.....	.....	.....	.....	.....	.....
730		-1.3803	.....	.....	.....	.....	.....	.....	.....	.....
740		.....	.....	.....	.....	.....	.....	.....	.....	.....
750		.....	.....	.....	.....	.....	.....	.....	.....	.....
760		.....	.....	.....	.....	.....	.....	.....	.....	.....
770		.....	.....	.....	.....	.....	.....	.....	.....	.....
780		.....	.....	.....	.....	.....	.....	.....	.....	.....
790		.....	.....	.....	.....	.....	.....	.....	.....	.....
800		.....	.....	.....	.....	.....	.....	.....	.....	.....
810		.....	.....	.....	.....	.....	.....	.....	.....	.....
820		.....	.....	.....	.....	.....	.....	.....	.....	.....
830		.....	.....	.....	.....	.....	.....	.....	.....	.....
840		.....	.....	.....	.....	.....	.....	.....	.....	.....
850		.....	.....	.....	.....	.....	.....	.....	.....	.....
860		.....	.....	.....	.....	.....	.....	.....	.....	.....
870		.....	.....	.....	.....	.....	.....	.....	.....	.....
880		.....	.....	.....	.....	.....	.....	.....	.....	.....
890		.....	.....	.....	.....	.....	.....	.....	.....	.....
900		.....	.....	.....	.....	.....	.....	.....	.....	.....
910		.....	.....	.....	.....	.....	.....	.....	.....	.....
920		.....	.....	.....	.....	.....	.....	.....	.....	.....
930		.....	.....	.....	.....	.....	.....	.....	.....	.....
940		.....	.....	.....	.....	.....	.....	.....	.....	.....
950		.....	.....	.....	.....	.....	.....	.....	.....	.....
960		.....	.....	.....	.....	.....	.....	.....	.....	.....
970		.....	.....	.....	.....	.....	.....	.....	.....	.....
980		.....	.....	.....	.....	.....	.....	.....	.....	.....
990		.....	.....	.....	.....	.....	.....	.....	.....	.....
1000		.....	.....	.....	.....	.....	.....	.....	.....	.....



## APPENDIX C

### CALCULATIONS FOR INTEGRATION USING SIMPSON'S RULE

A print of the calculations used to integrate source radiance, filter factor, and log spectral sensitivity at 10nm intervals using integration by Simpson's Rule are included here.

The integral was used in the  $T_{cs}$  calculation.

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Fast  
 D = 0.76  
 f = 13.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.849900000000ex 00	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.878800000000ex 00	.129964026935ex-05
700	.105000000000ex-04	.250000000000ex 00	.885800000000ex 00	.201803785095ex-04
710	.114000000000ex-04	.590000000000ex 00	.939200000000ex 00	.584732001781ex-04
720	.129000000000ex-04	.780000000000ex 00	.960100000000ex 00	.917876631134ex-04
730	.151000000000ex-04	.870000000000ex 00	.963400000000ex 00	.120752519178ex-03
740	.176000000000ex-04	.890000000000ex 00	.100400000000ex 01	.158089372075ex-03
750	.196000000000ex-04	.880000000000ex 00	.992000000000ex 00	.169331885212ex-03
760	.209000000000ex-04	.840000000000ex 00	.103750000000ex 01	.191392789483ex-03
770	.215000000000ex-04	.820000000000ex 00	.104690000000ex 01	.196404897166ex-03
780	.215000000000ex-04	.850000000000ex 00	.109650000000ex 01	.228221936248ex-03
790	.212000000000ex-04	.910000000000ex 00	.114180000000ex 01	.267409759401ex-03
800	.208000000000ex-04	.890000000000ex 00	.115070000000ex 01	.261910760499ex-03
810	.202000000000ex-04	.590000000000ex 00	.111300000000ex 01	.154597825515ex-03
820	.199000000000ex-04	.230000000000ex 00	.112120000000ex 01	.605035576799ex-04
830	.196000000000ex-04	.900000000000ex-01	.110200000000ex 01	.223099491693ex-04
840	.194000000000ex-04	.400000000000ex-01	.106890000000ex 01	.909414179200ex-05
850	.191000000000ex-04	.200000000000ex-01	.105460000000ex 01	.433174978899ex-05
860	.190000000000ex-04	.100000000000ex-01	.102500000000ex 01	.201258207784ex-05
870	.189000000000ex-04	.000000000000ex 00	.100990000000ex 01	.000000000000ex 00
INTEGRAL	.200867735546ex-01			

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Medium  
 D = 0.98  
 f = 16.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.689500000000ex 00	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.723800000000ex 00	.909542840187ex-06
700	.105000000000ex-04	.250000000000ex 00	.734400000000ex 00	.142406334428ex-04
710	.114000000000ex-04	.590000000000ex 00	.786900000000ex 00	.411772048539ex-04
720	.129000000000ex-04	.780000000000ex 00	.810400000000ex 00	.650255917364ex-04
730	.151000000000ex-04	.870000000000ex 00	.815700000000ex 00	.859401683132ex-04
740	.176000000000ex-04	.890000000000ex 00	.838700000000ex 00	.108044502591ex-03
750	.196000000000ex-04	.880000000000ex 00	.838600000000ex 00	.118942960386ex-03
760	.209000000000ex-04	.840000000000ex 00	.877500000000ex 00	.132411459374ex-03
770	.215000000000ex-04	.820000000000ex 00	.893800000000ex 00	.138055054676ex-03
780	.215000000000ex-04	.850000000000ex 00	.940200000000ex 00	.159241912792ex-03
790	.212000000000ex-04	.910000000000ex 00	.987200000000ex 00	.187317025699ex-03
800	.208000000000ex-04	.890000000000ex 00	.998400000000ex 00	.184439247478ex-03
810	.202000000000ex-04	.590000000000ex 00	.967900000000ex 00	.110688724021ex-03
820	.199000000000ex-04	.230000000000ex 00	.971700000000ex 00	.428825805862ex-04
830	.196000000000ex-04	.900000000000ex-01	.953000000000ex 00	.158306439349ex-04
840	.194000000000ex-04	.400000000000ex-01	.921200000000ex 00	.647234593188ex-05
850	.191000000000ex-04	.200000000000ex-01	.897700000000ex 00	.301830666628ex-05
860	.190000000000ex-04	.100000000000ex-01	.877300000000ex 00	.143236467189ex-05
870	.189000000000ex-04	.000000000000ex 00	.865200000000ex 00	.000000000000ex 00
INTEGRAL .141196660090ex-01				

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Fast  
 D = 0.52  
 f = 16.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.103120000000ex 01	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.105380000000ex 01	.194456811110ex-05
700	.105000000000ex-04	.250000000000ex 00	.105770000000ex 01	.299798397942ex-04
710	.114000000000ex-04	.590000000000ex 00	.110270000000ex 01	.852033877491ex-04
720	.129000000000ex-04	.790000000000ex 00	.112780000000ex 01	.136778174006ex-03
730	.151000000000ex-04	.870000000000ex 00	.113230000000ex 01	.178154255205ex-03
740	.176000000000ex-04	.890000000000ex 00	.117160000000ex 01	.232542680619ex-03
750	.196000000000ex-04	.880000000000ex 00	.115960000000ex 01	.249079934880ex-03
760	.209000000000ex-04	.840000000000ex 00	.120780000000ex 01	.283286300029ex-03
770	.215000000000ex-04	.820000000000ex 00	.120870000000ex 01	.285070522865ex-03
780	.215000000000ex-04	.850000000000ex 00	.125460000000ex 01	.328441015034ex-03
790	.212000000000ex-04	.910000000000ex 00	.130080000000ex 01	.385635719180ex-03
800	.208000000000ex-04	.890000000000ex 00	.131440000000ex 01	.381815312545ex-03
810	.202000000000ex-04	.590000000000ex 00	.126860000000ex 01	.221209299807ex-03
820	.199000000000ex-04	.230000000000ex 00	.128390000000ex 01	.879996434324ex-04
830	.196000000000ex-04	.900000000000ex-01	.126060000000ex 01	.321439009240ex-04
840	.194000000000ex-04	.400000000000ex-01	.123330000000ex 01	.132788884088ex-04
850	.191000000000ex-04	.200000000000ex-01	.122310000000ex 01	.638503618633ex-05
860	.190000000000ex-04	.100000000000ex-01	.118450000000ex 01	.290571891819ex-05
870	.189000000000ex-04	.000000000000ex 00	.117090000000ex 01	.000000000000ex 00
INTEGRAL .292445388171ex-01				

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Slow Med  
 D = 1.79 1.73  
 f = 13.0 9.5

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.141300000000ex 00	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.189400000000ex 00	.265719336595ex-06
700	.105000000000ex-04	.250000000000ex 00	.193100000000ex 00	.409476806657ex-05
710	.114000000000ex-04	.590000000000ex 00	.247300000000ex 00	.118865785041ex-04
720	.129000000000ex-04	.780000000000ex 00	.255900000000ex 00	.181377876477ex-04
730	.151000000000ex-04	.870000000000ex 00	.270400000000ex 00	.244847796477ex-04
740	.176000000000ex-04	.890000000000ex 00	.287500000000ex 00	.303670548895ex-04
750	.196000000000ex-04	.880000000000ex 00	.280100000000ex 00	.328729548695ex-04
760	.209000000000ex-04	.840000000000ex 00	.318200000000ex 00	.365279729191ex-04
770	.215000000000ex-04	.820000000000ex 00	.337200000000ex 00	.383223658220ex-04
780	.215000000000ex-04	.850000000000ex 00	.372500000000ex 00	.430881041311ex-04
790	.212000000000ex-04	.910000000000ex 00	.424400000000ex 00	.512598408243ex-04
800	.208000000000ex-04	.890000000000ex 00	.431400000000ex 00	.499865705109ex-04
810	.202000000000ex-04	.590000000000ex 00	.425100000000ex 00	.317178237206ex-04
820	.199000000000ex-04	.230000000000ex 00	.418900000000ex 00	.120082829454ex- 4
830	.196000000000ex-04	.900000000000ex-01	.381100000000ex 00	.424227268613ex-05
840	.194000000000ex-04	.400000000000ex-01	.363400000000ex 00	.179168526184ex-05
850	.191000000000ex-04	.200000000000ex-01	.344900000000ex 00	.845207540433ex-06
860	.190000000000ex-04	.100000000000ex-01	.328500000000ex 00	.404812207832ex-06
INTEGRAL .391999812243ex-02				

2.7<sup>02</sup>

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Med Fast  
 D = 1.26 1.23  
 f = 13.0 9.5

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.545700000000ex 00	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.586000000000ex 00	.662251818470ex-06 -1
700	.105000000000ex-04	.250000000000ex 00	.595500000000ex 00	.103425899756ex-04 -4
710	.114000000000ex-04	.590000000000ex 00	.647800000000ex 00	.298921300451ex-04 -2
720	.129000000000ex-04	.780000000000ex 00	.671700000000ex 00	.472480961039ex-04 -4
730	.151000000000ex-04	.870000000000ex 00	.676700000000ex 00	.624016681952ex-04 -2
740	.176000000000ex-04	.890000000000ex 00	.691700000000ex 00	.770198510608ex-04
750	.196000000000ex-04	.880000000000ex 00	.692100000000ex 00	.848865227083ex-04
760	.209000000000ex-04	.840000000000ex 00	.733800000000ex 00	.951098665198ex-04
770	.215000000000ex-04	.820000000000ex 00	.752700000000ex 00	.997590517393ex-04
780	.215000000000ex-04	.850000000000ex 00	.793900000000ex 00	.113699193893ex-03
790	.212000000000ex-04	.910000000000ex 00	.842100000000ex 00	.134114968906ex-03
800	.208000000000ex-04	.890000000000ex 00	.855500000000ex 00	.132725185687ex-03
810	.202000000000ex-04	.590000000000ex 00	.832300000000ex 00	.810034247970ex-04
820	.199000000000ex-04	.230000000000ex 00	.832700000000ex 00	.311372972338ex-04
830	.196000000000ex-04	.900000000000ex-01	.808100000000ex 00	.113396220773ex-04
840	.194000000000ex-04	.400000000000ex-01	.781500000000ex 00	.469204016643ex-05
850	.191000000000ex-04	.200000000000ex-01	.754000000000ex 00	.216802039265ex-05
860	.190000000000ex-04	.100000000000ex-01	.741700000000ex 00	.104822279782ex-05
870	.189000000000ex-04	.000000000000ex 00	.735100000000ex 00	.000000000000ex 00
INTEGRAL .101698510984ex-01				

3

FILM TYPE : 2424  
 FILTER : CC  
 STATION : 1  
 SHUTTER : Slow  
 D = 2.08  
 f = 9.5

691

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.429000000000ex-01	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.134000000000ex-01	.177183452351ex-06
700	.105000000000ex-04	.250000000000ex 00	.260000000000ex-01	.278695083765ex-05
710	.114000000000ex-04	.590000000000ex 00	.770000000000ex-01	.803076399059ex-05
720	.129000000000ex-04	.780000000000ex 00	.769000000000ex-01	.120111423209ex-04
730	.151000000000ex-04	.870000000000ex 00	.103000000000ex 00	.166531425618ex-04
740	.176000000000ex-04	.890000000000ex 00	.113600000000ex 00	.203471072590ex-04
750	.196000000000ex-04	.880000000000ex 00	.105900000000ex 00	.220109477828ex-04
760	.209000000000ex-04	.840000000000ex 00	.128500000000ex 00	.236007373756ex-04
770	.215000000000ex-04	.820000000000ex 00	.150100000000ex 00	.249087717080ex-04
780	.215000000000ex-04	.850000000000ex 00	.187500000000ex 00	.281421572637ex-04
790	.212000000000ex-04	.910000000000ex 00	.243300000000ex 00	.337813696025ex-04
800	.208000000000ex-04	.890000000000ex 00	.247500000000ex 00	.327305528946ex-04
810	.202000000000ex-04	.590000000000ex 00	.236600000000ex 00	.205496003964ex-04
820	.199000000000ex-04	.230000000000ex 00	.235700000000ex 00	.787555035083ex-05
830	.196000000000ex-04	.900000000000ex-01	.203700000000ex 00	.281967192922ex-05
840	.194000000000ex-04	.400000000000ex-01	.174000000000ex 00	.115840846183ex-05
850	.191000000000ex-04	.200000000000ex-01	.157200000000ex 00	.548609549411ex-06
860	.190000000000ex-04	.100000000000ex-01	.130700000000ex 00	.256716392343ex-06
870	.189000000000ex-04	.000000000000ex 00	.132400000000ex 00	.000000000000ex 00
INTEGRAL	.258579630066ex-02			

FILM TYPE : 2424

FILTER : CC

STATION : 1

SHUTTER : Slow

D = 1.65

f = 16.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
680	.883000000000ex-05	.000000000000ex 00	.280200000000ex 00	.000000000000ex 00
690	.859000000000ex-05	.200000000000ex-01	.327600000000ex 00	.365277699923ex-06
700	.105000000000ex-04	.250000000000ex 00	.331000000000ex 00	.562508782794ex-05
710	.114000000000ex-04	.590000000000ex 00	.386300000000ex 00	.163703084686ex-04
720	.129000000000ex-04	.780000000000ex 00	.402000000000ex 00	.253912635326ex-04
730	.151000000000ex-04	.870000000000ex 00	.407800000000ex 00	.335966673961ex-04
740	.176000000000ex-04	.890000000000ex 00	.425700000000ex 00	.417448278536ex-04
750	.196000000000ex-04	.880000000000ex 00	.419500000000ex 00	.453146618485ex-04
760	.209000000000ex-04	.840000000000ex 00	.464600000000ex 00	.511711965330ex-04
770	.215000000000ex-04	.820000000000ex 00	.483800000000ex 00	.537096487637ex-04
780	.215000000000ex-04	.850000000000ex 00	.519800000000ex 00	.604863510420ex-04
790	.212000000000ex-04	.910000000000ex 00	.570200000000ex 00	.717095922822ex-04
800	.208000000000ex-04	.890000000000ex 00	.580600000000ex 00	.704779627215ex-04
810	.202000000000ex-04	.590000000000ex 00	.572000000000ex 00	.444839538061ex-04
820	.199000000000ex-04	.230000000000ex 00	.565300000000ex 00	.168221271949ex-04
830	.196000000000ex-04	.900000000000ex-01	.524600000000ex 00	.590335065517ex-05
840	.194000000000ex-04	.400000000000ex-01	.508600000000ex 00	.250300502364ex-05
850	.191000000000ex-04	.200000000000ex-01	.485400000000ex 00	.116805518855ex-05
860	.190000000000ex-04	.100000000000ex-01	.476500000000ex 00	.569185202561ex-06
870	.189000000000ex-04	.000000000000ex 00	.479900000000ex 00	.000000000000ex 00

INTEGRAL .546689359420ex-02



FILM TYPE : 2424  
 FILTER : DD  
 STATION : 2  
 SHUTTER : Slow      Slow      Med  
           D =    2.07      2.25      2.01  
           f =    11.0      8.0      8.0

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
750	.196000000000ex-04	.000000000000ex 00	.105900000000ex 00	.000000000000ex 00
760	.209000000000ex-04	.100000000000ex-01	.128500000000ex 00	.280961159234ex-06
770	.215000000000ex-04	.200000000000ex-01	.150100000000ex 00	.607531017269ex-06
780	.215000000000ex-04	.500000000000ex-01	.187800000000ex 00	.165656493489ex-05
790	.212000000000ex-04	.130000000000ex 00	.243300000000ex 00	.482590994321ex-05
800	.208000000000ex-04	.310000000000ex 00	.247500000000ex 00	.114005296599ex-04
810	.202000000000ex-04	.530000000000ex 00	.236600000000ex 00	.184598105256ex-04
820	.199000000000ex-04	.720000000000ex 00	.235700000000ex 00	.246538967504ex-04
830	.196000000000ex-04	.840000000000ex 00	.203700000000ex 00	.263169380061ex-04
840	.194000000000ex-04	.910000000000ex 00	.174000000000ex 00	.263537925067ex-04
850	.191000000000ex-04	.940000000000ex 00	.157200000000ex 00	.257846488223ex-04
860	.190000000000ex-04	.950000000000ex 00	.130700000000ex 00	.243880572726ex-04
870	.189000000000ex-04	.960000000000ex 00	.132400000000ex 00	.246112140278ex-04
880	.186000000000ex-04	.960000000000ex 00	.530000000000ex-02	.180752443603ex-04
INTEGRAL .191407519392ex-02				

FILM TYPE : 2424

FILTER : DD

STATION : 2

SHUTTER : Slow

D = 1.63

f = 16.0

Med

1.63

11.0

Fast

1.59

8.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
750	.196000000000ex-04	.000000000000ex 00	.419500000000ex 00	.000000000000ex 00
760	.209000000000ex-04	.100000000000ex-01	.464600000000ex 00	.609180911107ex-06
770	.215000000000ex-04	.200000000000ex-01	.483800000000ex 00	.130999143326ex-05
780	.215000000000ex-04	.500000000000ex-01	.519800000000ex 00	.355802064953ex-05
790	.212000000000ex-04	.130000000000ex 00	.570200000000ex 00	.102442274688ex-04
800	.208000000000ex-04	.310000000000ex 00	.580600000000ex 00	.245485038693ex-04
810	.202000000000ex-04	.530000000000ex 00	.572000000000ex 00	.399601618936ex-04
820	.199000000000ex-04	.720000000000ex 00	.565300000000ex 00	.526605720886ex-04
830	.196000000000ex-04	.840000000000ex 00	.524600000000ex 00	.550979394483ex-04
840	.194000000000ex-04	.910000000000ex 00	.508600000000ex 00	.569433642879ex-04
850	.191000000000ex-04	.940000000000ex 00	.485400000000ex 00	.548985938620ex-04
860	.190000000000ex-04	.950000000000ex 00	.476500000000ex 00	.540725942433ex-04
870	.189000000000ex-04	.960000000000ex 00	.479900000000ex 00	.547813886817ex-04
880	.186000000000ex-04	.960000000000ex 00	.362800000000ex 00	.411703138053ex-04
890	.184000000000ex-04	.960000000000ex 00	.390000000000ex-02	.178233385316ex-04
900	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
910	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .467493827346ex-02				

FILM TYPE : 2424  
 FILTER : DD  
 STATION : 2  
 SHUTTER : Med Fast  
 D = 1.07 1.10  
 f = 16.0 11.0

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WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
750	.196000000000ex-04	.000000000000ex 00	.836800000000ex 00	.000000000000ex 00
760	.209000000000ex-04	.100000000000ex-01	.877500000000ex 00	.157632689732ex-05
770	.215000000000ex-04	.200000000000ex-01	.893800000000ex 00	.336719645551ex-05
780	.215000000000ex-04	.500000000000ex-01	.940200000000ex 00	.936717134072ex-05
790	.212000000000ex-04	.130000000000ex 00	.987200000000ex 00	.267595750999ex-04
800	.208000000000ex-04	.310000000000ex 00	.998400000000ex 00	.642428839531ex-04
810	.202000000000ex-04	.530000000000ex 00	.967900000000ex 00	.994322436123ex-04
820	.199000000000ex-04	.720000000000ex 00	.971700000000ex 00	.134241121835ex-03
830	.196000000000ex-04	.840000000000ex 00	.953000000000ex 00	.147752676726ex-03
840	.194000000000ex-04	.910000000000ex 00	.921200000000ex 00	.147245869950ex-03
850	.191000000000ex-04	.940000000000ex 00	.897700000000ex 00	.141860413315ex-03
860	.190000000000ex-04	.950000000000ex 00	.877300000000ex 00	.136074643829ex-03
870	.189000000000ex-04	.960000000000ex 00	.865200000000ex 00	.133024929433ex-03
880	.186000000000ex-04	.960000000000ex 00	.758600000000ex 00	.102419859859ex-03
890	.184000000000ex-04	.960000000000ex 00	.441500000000ex 00	.488190198842ex-04
900	.184000000000ex-04	.950000000000ex 00	.229000000000ex-01	.184264396159ex-04
INTEGRAL	.120037668642ex-01			

FILM TYPE : 2424  
 FILTER : DD  
 STATION : 2  
 SHUTTER : Fast  
 D = 0.59  
 f = 16.0

161

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
750	.196000000000ex-04	.000000000000ex 00	.115960000000ex 01	.000000000000ex 00
760	.209000000000ex-04	.100000000000ex-01	.120780000000ex 01	.337245595273ex-05
770	.215000000000ex-04	.200000000000ex-01	.120870000000ex 01	.695293958209ex-05
780	.215000000000ex-04	.500000000000ex-01	.125460000000ex 01	.193200597079ex-04
790	.212000000000ex-04	.130000000000ex 00	.130080000000ex 01	.550908170257ex-04
800	.208000000000ex-04	.310000000000ex 00	.131440000000ex 01	.132991850437ex-03
810	.202000000000ex-04	.530000000000ex 00	.126860000000ex 01	.198713438810ex-03
820	.199000000000ex-04	.720000000000ex 00	.128390000000ex 01	.275477144658ex-03
830	.196000000000ex-04	.840000000000ex 00	.126060000000ex 01	.300009741957ex-03
840	.194000000000ex-04	.910000000000ex 00	.123330000000ex 01	.302094711300ex-03
850	.191000000000ex-04	.940000000000ex 00	.122310000000ex 01	.300096700757ex-03
860	.190000000000ex-04	.950000000000ex 00	.118450000000ex 01	.276043297228ex-03
870	.189000000000ex-04	.960000000000ex 00	.117090000000ex 01	.268926151704ex-03
880	.186000000000ex-04	.960000000000ex 00	.108110000000ex 01	.215220768221ex-03
890	.184000000000ex-04	.960000000000ex 00	.767300000000ex 00	.103368700375ex-03
900	.184000000000ex-04	.950000000000ex 00	.383000000000ex 00	.422222553860ex-04
INTEGRAL .246887346193ex-01				

FILM TYPE : 2443

FILTER : EE

STATION : 3

LAYER : Blue

SHUTTER : Fast

D = 1.37

f = 8.0

Fast

2.90

11

Med

1.33

11

169

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
500	.878000000000ex-05	.000000000000ex 00	.983400000000ex 00	.000000000000ex 00
510	.907000000000ex-05	.100000000000ex 00	.103800000000ex 01	.989936385160ex-05
520	.922000000000ex-05	.520000000000ex 00	.114170000000ex 01	.664407099876ex-04
530	.944000000000ex-05	.780000000000ex 00	.117690000000ex 01	.110653867319ex-03
540	.974000000000ex-05	.890000000000ex 00	.122110000000ex 01	.144227794864ex-03
550	.989000000000ex-05	.930000000000ex 00	.121730000000ex 01	.151697785218ex-03
560	.100000000000ex-04	.950000000000ex 00	.121450000000ex 01	.155676695821ex-03
570	.101000000000ex-04	.955000000000ex 00	.118130000000ex 01	.146428207288ex-03
580	.103000000000ex-04	.960000000000ex 00	.111280000000ex 01	.128206031658ex-03
590	.106000000000ex-04	.965000000000ex 00	.508200000000ex 00	.329634894190ex-04
600	.108000000000ex-04	.965000000000ex 00	.500000000000ex-02	.103027003525ex-04
610	.104000000000ex-04	.965000000000ex 00	.588300000000ex 00	.258976676178ex-05
620	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .942212594920ex-02				

FILM TYPE : 2443

FILTER : EE

STATION : 3

LAYER : Blue

SHUTTER : Fast

D = 0.57

f = 5.6

Med

0.32

5.6

Slow

0.23

5.6

Med

0.56

8.0

Slow

0.32

8.0

Slow

0.54

11.0

170

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
500	.878000000000ex-05	.000000000000ex 00	.771800000000ex 00	.000000000000ex 00
510	.907000000000ex-05	.100000000000ex 00	.833000000000ex 00	.617457808335ex-05
520	.922000000000ex-05	.520000000000ex 00	.917800000000ex 00	.396765831473ex-04
530	.944000000000ex-05	.780000000000ex 00	.980800000000ex 00	.704476640380ex-04
540	.974000000000ex-05	.890000000000ex 00	.103130000000ex 01	.931641795108ex-04
550	.989000000000ex-05	.930000000000ex 00	.103460000000ex 01	.996045643166ex-04
560	.100000000000ex-04	.950000000000ex 00	.102500000000ex 01	.100629103892ex-03
570	.101000000000ex-04	.955000000000ex 00	.100130000000ex 01	.967441571587ex-04
580	.103000000000ex-04	.960000000000ex 00	.922100000000ex 00	.826434536104ex-04
590	.106000000000ex-04	.965000000000ex 00	.353800000000ex 00	.231011275812ex-04
600	.108000000000ex-04	.965000000000ex 00	-.167200000000ex 00	.709171165028ex-05
610	.104000000000ex-04	.965000000000ex 00	-.832200000000ex 00	.147693251824ex-05
620	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00

INTEGRAL .612202052796ex-02

FILM TYPE : 2443

FILTER : EE

STATION : 3

LAYER : Red

SHUTTER : Fast

D = 0.17

f = 5.6

Med

0.11

5.6

Slow

0.08

5.6

Fast

0.39

8.0

Med

0.18

8.0

Slow

0.11

8.0

Fast

0.89

11

Med

0.39

11

Slow

0.20

11

171

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
500	.878000000000ex-05	.000000000000ex 00	.111300000000ex 00	.000000000000ex 00
510	.907000000000ex-05	.100000000000ex 00	.478000000000ex-01	.812469912434ex-06
520	.922000000000ex-05	.520000000000ex 00	.105900000000ex 00	.375694004710ex-05
530	.944000000000ex-05	.780000000000ex 00	.120000000000ex 00	.558555840043ex-05
540	.974000000000ex-05	.890000000000ex 00	.142600000000ex 00	.624236219187ex-05
550	.989000000000ex-05	.930000000000ex 00	.219300000000ex 00	.555110241800ex-05
560	.100000000000ex-04	.950000000000ex 00	.187700000000ex 00	.616628516673ex-05
570	.101000000000ex-04	.955000000000ex 00	.118300000000ex 00	.734555720709ex-05
580	.103000000000ex-04	.960000000000ex 00	.134000000000ex-01	.958756801185ex-05
590	.106000000000ex-04	.965000000000ex 00	.103800000000ex 00	.129907186974ex-04
600	.108000000000ex-04	.965000000000ex 00	.165800000000ex 00	.152669073086ex-04
610	.104000000000ex-04	.965000000000ex 00	.218200000000ex 00	.165867253177ex-04
620	.990000000000ex-05	.965000000000ex 00	.252300000000ex 00	.170790027296ex-04
630	.939000000000ex-05	.965000000000ex 00	.247400000000ex 00	.160174326153ex-04
640	.906000000000ex-05	.965000000000ex 00	.278300000000ex 00	.165941690862ex-04
650	.869000000000ex-05	.965000000000ex 00	.311100000000ex 00	.171651297190ex-04
660	.854000000000ex-05	.965000000000ex 00	.346300000000ex 00	.182930105157ex-04
670	.872000000000ex-05	.965000000000ex 00	.372600000000ex 00	.198446662038ex-04
680	.883000000000ex-05	.965000000000ex 00	.364800000000ex 00	.197373124811ex-04
690	.859000000000ex-05	.965000000000ex 00	.391700000000ex 00	.204277473172ex-04
700	.105000000000ex-04	.965000000000ex 00	.456100000000ex 00	.289612039766ex-04
710	.114000000000ex-04	.965000000000ex 00	.495600000000ex 00	.344375434922ex-04
720	.129000000000ex-04	.965000000000ex 00	.549300000000ex 00	.440978101742ex-04
730	.151000000000ex-04	.965000000000ex 00	.531600000000ex 00	.495569147308ex-04
740	.176000000000ex-04	.965000000000ex 00	.517900000000ex 00	.559680249185ex-04
750	.196000000000ex-04	.965000000000ex 00	.448100000000ex 00	.530741912055ex-04
760	.209000000000ex-04	.965000000000ex 00	.398200000000ex 00	.504514438269ex-04
770	.215000000000ex-04	.965000000000ex 00	.353600000000ex 00	.468344876143ex-04
780	.215000000000ex-04	.965000000000ex 00	.374700000000ex 00	.491661014854ex-04
790	.212000000000ex-04	.965000000000ex 00	.395000000000ex 00	.507999370680ex-04
800	.208000000000ex-04	.965000000000ex 00	.410300000000ex 00	.516286356347ex-04
810	.202000000000ex-04	.965000000000ex 00	.395400000000ex 00	.484483156260ex-04
820	.199000000000ex-04	.965000000000ex 00	.380800000000ex 00	.461509228499ex-04
830	.196000000000ex-04	.965000000000ex 00	.330400000000ex 00	.404746763533ex-04
840	.194000000000ex-04	.965000000000ex 00	.284700000000ex 00	.360602757383ex-04
850	.191000000000ex-04	.965000000000ex 00	.262400000000ex 00	.337256773302ex-04
860	.190000000000ex-04	.965000000000ex 00	.260700000000ex 00	.334180353661ex-04
870	.189000000000ex-04	.965000000000ex 00	.228200000000ex 00	.308453084509ex-04
880	.186000000000ex-04	.965000000000ex 00	.462000000000ex-01	.199636642636ex-04
890	.184000000000ex-04	.965000000000ex 00	.389600000000ex 00	.724010953003ex-05
900	.184000000000ex-04	.965000000000ex 00	.833700000000ex 00	.260402492193ex-05
INTEGRAL	.104361348440ex-01			

FILM TYPE : 2443  
 FILTER : EE  
 STATION : 3  
 LAYER : Green  
 SHUTTER : Fast Med Slow Fast Med Slow Med Slow  
 D = 0.39 0.18 0.15 0.95 0.39 0.18 0.92 0.37  
 f = 5.6 5.6 5.6 8.0 8.0 8.0 11 11

WL RADIANCE FILTER FACTOR LOG SPECT.SENSI. PRODUCT  
 500 .878000000000ex-05 .000000000000ex 00-.235000000000ex 03 .000000000000ex 00  
 510 .907000000000ex-05 .100000000000ex 00-.154300000000ex 00 .635780622247ex-06  
 520 .922000000000ex-05 .520000000000ex 00-.236100000000ex 00 .278377586147ex-05  
 530 .944000000000ex-05 .780000000000ex 00-.267200000000ex 00 .397984902043ex-05  
 540 .974000000000ex-05 .890000000000ex 00-.196300000000ex 00 .551631380154ex-05  
 550 .989000000000ex-05 .930000000000ex 00-.151900000000ex 00 .648304804558ex-05  
 560 .100000000000ex-04 .950000000000ex 00-.161000000000ex-01 .915426763372ex-05  
 570 .101000000000ex-04 .955000000000ex 00-.127500000000ex 00 .719158711061ex-05  
 580 .103000000000ex-04 .960000000000ex 00 .305100000000ex 00 .199622025419ex-04  
 590 .106000000000ex-04 .965000000000ex 00 .413000000000ex 00 .264748299090ex-04  
 600 .108000000000ex-04 .965000000000ex 00 .406900000000ex 00 .265981278259ex-04  
 610 .104000000000ex-04 .965000000000ex 00 .434500000000ex 00 .272935893264ex-04  
 620 .990000000000ex-05 .965000000000ex 00 .398000000000ex 00 .238870494130ex-04  
 630 .939000000000ex-05 .965000000000ex 00 .614500000000ex 00 .372986321808ex-04  
 640 .906000000000ex-05 .965000000000ex 00 .717000000000ex 00 .455675323971ex-04  
 650 .869000000000ex-05 .965000000000ex 00 .814000000000ex 00 .546445796833ex-04  
 660 .854000000000ex-05 .965000000000ex 00 .479300000000ex 00 .248476421621ex-04  
 670 .872000000000ex-05 .965000000000ex 00-.129700000000ex 00 .624228794928ex-05  
 680 .883000000000ex-05 .965000000000ex 00-.101100000000ex 01 .830783795351ex-06  
 690 .859000000000ex-05 .965000000000ex 00-.104110000000ex 01 .754085304095ex-06  
 700 .000000000000ex 00 .000000000000ex 00 .000000000000ex 00 .000000000000ex 00  
 INTEGRAL .334096155820ex-02



FILM TYPE : 2443  
FILTER : EE  
STATION : 3  
LAYER : Green

SHUTTER : Fast

D = 1.75

f = 11

173

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
500	.878000000000ex-05	.000000000000ex 00	.193600000000ex 00	.000000000000ex 00
510	.907000000000ex-05	.100000000000ex 00	.688000000000ex-01	.106269169623ex-05
520	.922000000000ex-05	.520000000000ex 00	.670000000000ex-02	.486893822780ex-05
530	.944000000000ex-05	.780000000000ex 00	-.282000000000ex-01	.690027814209ex-05
540	.974000000000ex-05	.890000000000ex 00	.650000000000ex-02	.879931699704ex-05
550	.989000000000ex-05	.930000000000ex 00	.111000000000ex-01	.943581114780ex-05
560	.100000000000ex-04	.950000000000ex 00	.203400000000ex 00	.151748219918ex-04
570	.101000000000ex-04	.955000000000ex 00	.341400000000ex 00	.211701894923ex-04
580	.103000000000ex-04	.960000000000ex 00	.517600000000ex 00	.325618039949ex-04
590	.106000000000ex-04	.965000000000ex 00	.611000000000ex 00	.417669900280ex-04
600	.108000000000ex-04	.965000000000ex 00	.619800000000ex 00	.434261240705ex-04
610	.104000000000ex-04	.965000000000ex 00	.703900000000ex 00	.507528754515ex-04
620	.990000000000ex-05	.965000000000ex 00	.754100000000ex 00	.542328600176ex-04
630	.939000000000ex-05	.965000000000ex 00	.944700000000ex 00	.797797930868ex-04
640	.906000000000ex-05	.965000000000ex 00	.113500000000ex 01	.119304139048ex-03
650	.869000000000ex-05	.965000000000ex 00	.124140000000ex 01	.146199904789ex-03
660	.854000000000ex-05	.965000000000ex 00	.754800000000ex 00	.468581549364ex-04
670	.872000000000ex-05	.965000000000ex 00	.194400000000ex 00	.131656952542ex-04
680	.883000000000ex-05	.965000000000ex 00	-.532600000000ex 00	.249970072933ex-05
690	.859000000000ex-05	.965000000000ex 00	-.573000000000ex 00	.221574856736ex-05
700	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .715083876866ex-02				

FILM TYPE: SO-356

FILTER : FF

STATION : 4

LAYER : Red

SHUTTER: Fast

D = 1.54

f = 4.0

174

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
420	.364000000000ex-05	.310000000000ex	00-.109520000000ex 01	.906281422137ex-07
430	.455000000000ex-05	.640000000000ex	00-.834900000000ex 00	.425884045335ex-06
440	.532000000000ex-05	.780000000000ex	00-.888800000000ex 00	.536051153623ex-06
450	.657000000000ex-05	.850000000000ex	00-.978500000000ex 00	.586792149966ex-06
460	.685000000000ex-05	.890000000000ex	00-.107150000000ex 01	.517107192113ex-06
470	.746000000000ex-05	.910000000000ex	00-.111970000000ex 01	.515323822748ex-06
480	.803000000000ex-05	.930000000000ex	00-.121350000000ex 01	.456770969188ex-06
490	.853000000000ex-05	.940000000000ex	00-.120890000000ex 01	.495652024915ex-06
500	.878000000000ex-05	.950000000000ex	00-.120110000000ex 01	.524950218948ex-06
510	.907000000000ex-05	.945000000000ex	00-.110570000000ex 01	.671953306877ex-06
520	.922000000000ex-05	.945000000000ex	00-.103080000000ex 01	.811638668180ex-06
530	.944000000000ex-05	.945000000000ex	00-.931600000000ex 00	.104424836223ex-05
540	.974000000000ex 00	.950000000000ex-05	00-.839800000000ex 00	.133808148729ex-05
550	.989000000000ex-05	.955000000000ex	00-.761600000000ex 00	.163530838347ex-05
560	.100000000000ex-04	.965000000000ex	00-.566800000000ex 00	.261653960837ex-05
570	.101000000000ex-04	.960000000000ex	00-.409100000000ex 00	.378000702380ex-05
580	.103000000000ex-04	.955000000000ex	00-.258100000000ex 00	.542925945435ex-05
590	.106000000000ex-04	.945000000000ex	00-.119100000000ex 00	.761443482582ex-05
600	.108000000000ex-04	.940000000000ex	00-.297000000000ex-01	.108705522810ex-04
610	.104000000000ex-04	.940000000000ex	00-.166400000000ex 00	.143403976068ex-04
620	.990000000000ex-05	.940000000000ex	00-.360600000000ex 00	.213482877619ex-04
630	.939000000000ex-05	.940000000000ex	00-.517900000000ex 00	.290866326392ex-04
640	.906000000000ex-05	.940000000000ex	00-.709500000000ex 00	.436270704607ex-04
650	.869000000000ex-05	.940000000000ex	00-.784300000000ex 00	.497104426142ex-04
660	.854000000000ex-05	.940000000000ex	00-.584700000000ex 00	.308521706084ex-04
670	.872000000000ex-05	.940000000000ex	00-.590000000000ex-01	.938954047847ex-05
680	.883000000000ex-05	.940000000000ex	00-.313400000000ex 00	.403356033094ex-05
690	.859000000000ex-05	.940000000000ex	00-.911500000000ex 00	.989967682829ex-06
700	.000000000000ex 00	.000000000000ex	00-.000000000000ex 00	.000000000000ex 00
INTEGRAL .242387016130ex-02				

FILM TYPE : SO-356

FILTER : FF

STATION : 4

LAYER : Red

SHUTTER : Fast

D = 0.99

f = 2.8

Med

0.53

2.8

Slow

0.25

2.8

Fast

1.24

3.5

Med

0.71

3.5

Slow

0.35

3.5

Med

0.97

4.0

Slow

0.53

4.0

175

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
420	.364000000000ex-05	.310000000000ex	00-.137110000000ex 01	.480134681554ex-07
430	.455000000000ex-05	.640000000000ex	00-.109420000000ex 01	.234418223635ex-06
440	.532000000000ex-05	.780000000000ex	00-.115010000000ex 01	.293701547621ex-06
450	.657000000000ex-05	.850000000000ex	00-.123590000000ex 01	.324402576818ex-06
460	.685000000000ex-05	.890000000000ex	00-.133010000000ex 01	.130370874334ex-03
470	.476000000000ex-05	.910000000000ex	00-.144310000000ex 01	.156152285478ex-06
480	.803000000000ex-05	.930000000000ex	00-.146670000000ex 01	.254975524502ex-06
490	.853000000000ex-05	.940000000000ex	00-.146160000000ex 01	.276998160354ex-06
500	.878000000000ex-05	.950000000000ex	00-.146930000000ex 01	.283085823553ex-06
510	.907000000000ex-05	.945000000000ex	00-.137770000000ex 01	.359202289035ex-06
520	.922000000000ex-05	.945000000000ex	00-.128440000000ex 01	.452650213514ex-06
530	.944000000000ex-05	.945000000000ex	00-.117320000000ex 01	.598692479547ex-06
540	.974000000000ex-05	.950000000000ex	00-.110260000000ex 01	.730604868994ex-06
550	.989000000000ex-05	.955000000000ex	00-.103380000000ex 01	.873775097460ex-06
560	.100000000000ex-04	.965000000000ex	00-.829800000000ex 00	.142799706012ex-05
570	.101000000000ex-04	.960000000000ex	00-.671800000000ex 00	.206439408872ex-05
580	.103000000000ex-04	.955000000000ex	00-.526000000000ex 03	.000000000000ex 00
590	.106000000000ex-04	.945000000000ex	00-.360700000000ex 00	.436553700351ex-05
600	.108000000000ex-04	.940000000000ex	00-.218400000000ex 00	.613976302478ex-05
610	.104000000000ex-04	.940000000000ex	00-.102000000000ex 00	.772967426732ex-05
620	.990000000000ex-05	.940000000000ex	00-.417000000000ex-01	.102438461717ex-04
630	.939000000000ex-05	.940000000000ex	00-.262900000000ex 00	.161693829137ex-04
640	.906000000000ex-05	.940000000000ex	00-.476900000000ex 00	.255361870753ex-04
650	.869000000000ex-05	.940000000000ex	00-.535500000000ex 00	.280315833943ex-04
660	.854000000000ex-05	.940000000000ex	00-.321200000000ex 00	.168184405456ex-04
670	.872000000000ex-00	.940000000000ex-05	.203400000000ex 00	.513150006253ex-05
680	.883000000000ex-05	.940000000000ex	00-.591100000000ex 00	.212808297435ex-05
690	.859000000000ex-05	.940000000000ex	00-.128960000000ex 01	.414496642878ex-06
700	.000000000000ex 00	.000000000000ex	00-.000000000000ex 00	.000000000000ex 00
INTEGRAL .218776423242ex-02				

FIIM TYPE : SO-356

FILTER : FF

STATION : 4

LAYER : Green

SHUTTER : Fast

D = 1.56

f = 3.5

Fast

1.88

4.0

176

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.000000000000ex	00-.142050000000ex 01	.000000000000ex 00
410	.247000000000ex-05	.300000000000ex-01	.124390000000ex 01	.422589019275ex-08
420	.364000000000ex-05	.310000000000ex	00-.761700000000ex 00	.195327358740ex-06
430	.455000000000ex-05	.640000000000ex	00-.567800000000ex 00	.787755366862ex-06
440	.532000000000ex-05	.780000000000ex	00-.610400000000ex 00	.101766827275ex-05
450	.657000000000ex-05	.850000000000ex	00-.694400000000ex 00	.112871499650ex-05
460	.685000000000ex-05	.890000000000ex	00-.761900000000ex 00	.105482539795ex-05
470	.746000000000ex-05	.910000000000ex	00-.761300000000ex 00	.117619741283ex-05
480	.803000000000ex-05	.930000000000ex	00-.670300000000ex 00	.159550619142ex-05
490	.853000000000ex-05	.940000000000ex	00-.461900000000ex 00	.276806882876ex-05
500	.878000000000ex-05	.950000000000ex	00-.282800000000ex 00	.434928754514ex-05
510	.907000000000ex-05	.945000000000ex	00-.821000000000ex-01	.709478265433ex-05
520	.922000000000ex-05	.945000000000ex	00-.124600000000ex 00	.116081424668ex-04
530	.944000000000ex-05	.945000000000ex	00-.355100000000ex 00	.202070912582ex-04
540	.974000000000ex-05	.950000000000ex	00-.528500000000ex 00	.312451462748ex-04
550	.989000000000ex-05	.955000000000ex	00-.617300000000ex 00	.391290823659ex-04
560	.100000000000ex-04	.965000000000ex	00-.352800000000ex 00	.217433928888ex-04
570	.101000000000ex-04	.960000000000ex	00-.318500000000ex 00	.201879679610ex-04
580	.103000000000ex-04	.955000000000ex	00-.149800000000ex 00	.138880284113ex-04
590	.106000000000ex-04	.945000000000ex	00-.883900000000ex 00	.130869268157ex-05
600	.108000000000ex-04	.940000000000ex	00-.166480000000ex 01	.219660318555ex-06
INTEGRAL .182928209198ex-02				

FILM TYPE : SO-356

FILTER : FF

STATION : 4

LAYER : Green

SHUTTER : Fast

D = 1.28

f = 2.8

Med

0.69

2.8

Slow

0.31

2.8

Med

0.93

3.5

Slow

0.44

3.5

Med

1.27

4.0

Slow

0.69

4.0

177

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
410	.247000000000ex-05	.300000000000ex-01	.159190000000ex 01	.189634874236ex-08
420	.364000000000ex-05	.310000000000ex 00	.144000000000ex 01	.409697277001ex-07
430	.455000000000ex-05	.640000000000ex 00	.834500000000ex 00	.426276479734ex-06
440	.532000000000ex-05	.780000000000ex 00	.902600000000ex 00	.519285546653ex-06
450	.657000000000ex-05	.850000000000ex 00	.969800000000ex 00	.598665588228ex-06
460	.685000000000ex-05	.890000000000ex 00	.102330000000ex 01	.577804045366ex-06
470	.746000000000ex-05	.910000000000ex 00	.105900000000ex 01	.592625343141ex-06
480	.803000000000ex-05	.930000000000ex 00	.943700000000ex 00	.850155744770ex-06
490	.853000000000ex-05	.940000000000ex 00	.740300000000ex 00	.145806499887ex-05
500	.878000000000ex-05	.950000000000ex 00	.538700000000ex 00	.241278220525ex-05
510	.907000000000ex-05	.945000000000ex 00	.380500000000ex 00	.356893875735ex-05
520	.922000000000ex-05	.945000000000ex 00	.157700000000ex 00	.605986193556ex-05
530	.944000000000ex-05	.945000000000ex 00	.790000000000ex-01	.107004933835ex-04
540	.979000000000ex-05	.950000000000ex 00	.250500000000ex 00	.165579397162ex-04
550	.989000000000ex-05	.955000000000ex 00	.353600000000ex 00	.213206118227ex-04
560	.100000000000ex-04	.965000000000ex 00	.858000000000ex-01	.117578337001ex-04
570	.101000000000ex-04	.960000000000ex 00	.708000000000ex-01	.114128105154ex-04
580	.103000000000ex-04	.955000000000ex 00	.110200000000ex 00	.763203926933ex-05
590	.106000000000ex-04	.945000000000ex 00	.112790000000ex 00	.772587493829ex-05
INTEGRAL	.100288250556ex-02			

FILM TYPE : SO-356

FILTER : FE

STATION : 4

LAYER : Blue

SHUTTER : Fast

D = 1.85

f = 2.8

Fast

2.12

3.5

Medium

1.51

3.5

Fast

2.39

4.0

Medium

1.86

4.0

X

178

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.000000000000ex 00	-.691900000000ex 00	.000000000000ex 00
410	.247000000000ex-05	.300000000000ex-01	-.283500000000ex 00	.385760901522ex-07
420	.364000000000ex-05	.310000000000ex 00	.298600000000ex 00	.224420785171ex-05
430	.455000000000ex-05	.640000000000ex 00	.476700000000ex 00	.872753040813ex-05
440	.532000000000ex-05	.780000000000ex 00	.398300000000ex 00	.103826026841ex-04
450	.657000000000ex-05	.850000000000ex 00	.295100000000ex 00	.110175313581ex-04
460	.685000000000ex-05	.890000000000ex 00	.167100000000ex 00	.895737132517ex-05
470	.746000000000ex-05	.910000000000ex 00	.297000000000ex-01	.726909290931ex-05
480	.803000000000ex-05	.930000000000ex 00	-.227000000000ex-01	.708758848415ex-05
490	.853000000000ex-05	.940000000000ex 00	-.802000000000ex 03	.000000000000ex 00
500	.878000000000ex-05	.950000000000ex 00	-.213800000000ex 00	.509821470384ex-05
510	.907000000000ex-05	.945000000000ex 00	-.409600000000ex 00	.333763695652ex-05
520	.922000000000ex-05	.945000000000ex 00	-.722000000000ex 00	.165258090209ex-05
530	.944000000000ex-05	.945000000000ex 00	-.118900000000ex 01	.577302984655ex-06
540	.974000000000ex-05	.950000000000ex 00	-.170750000000ex 01	.181460691766ex-06
INTEGRAL .649657584726ex-03				

FILM TYPE : SO-356

FILTER : FF

STATION : 4

LAYER : Blue

SHUTTER : Med

Slow

Slow

Slow

D = 1.27

0.81

0.99

1.26

f = 2.8

2.8

3.5

4.0

179

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
390	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
400	.124000000000ex-05	.000000000000ex 00	-.100690000000ex 01	.000000000000ex 00
410	.249000000000ex-05	.300000000000ex-01	-.661200000000ex 00	.162974854435ex-07
420	.364000000000ex-05	.310000000000ex 00	-.450000000000ex-01	.101733287167ex-05
430	.455000000000ex-05	.640000000000ex 00	.100000000000ex 00	.366599079913ex-05
440	.532000000000ex-05	.780000000000ex 00	.311000000000ex-01	.445765275978ex-05
450	.657000000000ex-05	.850000000000ex 00	-.100000000000ex 00	.443592602682ex-05
460	.685000000000ex-05	.890000000000ex 00	-.188500000000ex 00	.394984977281ex-05
470	.746000000000ex-05	.910000000000ex 00	-.329800000000ex 00	.317672938128ex-05
480	.803000000000ex-05	.930000000000ex 00	-.359200000000ex 00	.326586699541ex-05
490	.853000000000ex-05	.940000000000ex 00	-.382400000000ex 00	.332412146527ex-05
500	.872000000000ex-05	.950000000000ex 00	-.501100000000ex 00	.261300409429ex-05
510	.907000000000ex-05	.945000000000ex 00	-.715700000000ex 00	.164944977331ex-05
520	.922000000000ex-05	.945000000000ex 00	-.108070000000ex 01	.723540306579ex-06
530	.944000000000ex-05	.945000000000ex 00	-.154620000000ex 01	.253631857787ex-06
INTEGRAL .322998829740ex-03				

FILM TYPE : SO-022  
FILTER : BB  
STATION : 5  
SHUTTER : Slow  
D = 1.22  
f = 8.0

FILM TYPE : SO-022  
FILTER : BB  
STATION : 5  
SHUTTER : Medium  
D = 1.23  
f = 5.6

FILM TYPE : SO-022  
FILTER : BB  
STATION : 5  
SHUTTER : Fast  
D = 1.25  
f = 4.0

181

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
570	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
580	.103000000000ex-04	.000000000000ex 00	.417700000000ex 00	.000000000000ex 00
590	.106000000000ex-04	.100000000000ex 00	.387400000000ex 00	.258646058899ex-05
600	.108000000000ex-04	.600000000000ex 00	.339200000000ex 00	.141506049228ex-04
610	.104000000000ex-04	.860000000000ex 00	.307500000000ex 00	.181564856416ex-04
620	.990000000000ex-05	.940000000000ex 00	.308500000000ex 00	.189349014105ex-04
630	.939000000000ex-05	.960000000000ex 00	.229200000000ex 00	.152804739665ex-04
640	.906000000000ex-05	.970000000000ex 00	.219500000000ex 00	.145679999717ex-04
650	.869000000000ex-05	.960000000000ex 00	.235600000000ex 00	.143512922822ex-04
660	.854000000000ex-05	.960000000000ex 00	.311600000000ex 00	.168007668005ex-04
670	.872000000000ex-05	.960000000000ex 00	.395800000000ex 00	.208251298474ex-04
680	.883000000000ex-05	.960000000000ex 00	.432900000000ex 00	.229684631322ex-04
690	.859000000000ex-05	.960000000000ex 00	.332100000000ex 00	.177159480000ex-04
700	.105000000000ex-04	.960000000000ex 00	.210800000000ex 00	.620383919268ex-05
710	.114000000000ex-04	.960000000000ex 00	.947800000000ex 00	.123417312291ex-05
INTEGRAL	.184524018497ex-02			



FILM TYPE : SO-022

FILTER : BB

STATION : 5

SHUTTER : Fast

D = 0.40

f = 8.0

181

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
570	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
580	.103000000000ex-04	.000000000000ex 00	.109310000000ex 01	.000000000000ex 00
590	.106000000000ex-04	.100000000000ex 00	.108730000000ex 01	.129600257750ex-04
600	.108000000000ex-04	.600000000000ex 00	.106260000000ex 01	.748471048064ex-04
610	.104000000000ex-04	.860000000000ex 00	.102890000000ex 01	.955942544729ex-04
620	.990000000000ex-05	.940000000000ex 00	.987400000000ex 00	.903988796658ex-04
630	.939000000000ex-05	.960000000000ex 00	.939400000000ex 00	.784037482134ex-04
640	.906000000000ex-05	.970000000000ex 00	.886300000000ex 00	.676394288813ex-04
650	.869000000000ex-05	.960000000000ex 00	.868300000000ex 00	.616014605819ex-04
660	.854000000000ex-05	.960000000000ex 00	.101210000000ex 01	.843002968116ex-04
670	.872000000000ex-05	.960000000000ex 00	.113930000000ex 01	.115368625364ex-03
680	.883000000000ex-05	.960000000000ex 00	.112480000000ex 01	.112987899927ex-03
690	.859000000000ex-05	.960000000000ex 00	.104460000000ex 01	.913827865370ex-04
700	.105000000000ex-04	.960000000000ex 00	.455600000000ex 00	.287779949543ex-04
710	.114000000000ex-04	.960000000000ex 00	.158000000000ex 00	.760634613166ex-05
720	.129000000000ex-04	.960000000000ex 00	.786900000000ex 00	.202283725413ex-05
730	.151000000000ex-04	.960000000000ex 00	.138030000000ex 01	.603876571012ex-06
INTEGRAL	.923445379953ex-02			

FILM TYPE : SO-022  
 FILTER : BB  
 STATION : 5  
 SHUTTER : Medium  
 D = 0.73  
 f = 8.0

FILM TYPE : SO-022  
 FILTER : BB  
 STATION : 5  
 SHUTTER : Fast  
 D = 0.75  
 f = 5.6

182

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
580	.103000000000ex-04	.000000000000ex 00	.683900000000ex 00	.000000000000ex 00
590	.106000000000ex-04	.100000000000ex 00	.654700000000ex 00	.478636556395ex-05
600	.108000000000ex-04	.600000000000ex 00	.606300000000ex 00	.261742957839ex-04
610	.104000000000ex-04	.860000000000ex 00	.575500000000ex 00	.336536203068ex-04
620	.990000000000ex-05	.940000000000ex 00	.551600000000ex 00	.331408046065ex-04
630	.939000000000ex-05	.960000000000ex 00	.449600000000ex 00	.253826420489ex-04
640	.906000000000ex-05	.970000000000ex 00	.490600000000ex 00	.271956805992ex-04
650	.869000000000ex-05	.960000000000ex 00	.495600000000ex 00	.261150588882ex-04
660	.854000000000ex-05	.960000000000ex 00	.579400000000ex 00	.311264150174ex-04
670	.872000000000ex-05	.960000000000ex 00	.648800000000ex 00	.372895994159ex-04
680	.883000000000ex-05	.960000000000ex 00	.687100000000ex 00	.412412610701ex-04
690	.859000000000ex-05	.960000000000ex 00	.596300000000ex 00	.325510046313ex-04
700	.105000000000ex-04	.960000000000ex 00	.496000000000ex-01	.112995339698ex-04
710	.114000000000ex-04	.960000000000ex 00	.581900000000ex 00	.286599932894ex-05
720	.129000000000ex-04	.960000000000ex 00	.154580000000ex 01	.352420321737ex-06
INTEGRAL .330428521048ex-02				

FILM TYPE : SO-022

FILTER : BB

STATION : 5

SHUTTER : Slow

D = 2.20

f = 4.0

183

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
570	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
580	.103000000000ex-04	.000000000000ex 00	.588000000000ex-01	.000000000000ex 00
590	.106000000000ex-04	.100000000000ex 00	-.919000000000ex-01	.857839155156ex-06
600	.108000000000ex-04	.600000000000ex 00	-.133300000000ex 00	.476732770079ex-05
610	.104000000000ex-04	.860000000000ex 00	-.175000000000ex 00	.597766799874ex-05
620	.990000000000ex-05	.940000000000ex 00	-.208400000000ex 00	.575921177105ex-05
630	.939000000000ex-05	.960000000000ex 00	-.241800000000ex 00	.516579092867ex-05
640	.906000000000ex-05	.970000000000ex 00	-.229800000000ex 00	.517725947918ex-05
650	.869000000000ex-05	.960000000000ex 00	-.228800000000ex 00	.492596145805ex-05
660	.854000000000ex-05	.960000000000ex 00	-.153800000000ex 00	.575346007484ex-05
670	.872000000000ex-05	.960000000000ex 00	-.801000000000ex-01	.696125780724ex-05
680	.883000000000ex-05	.960000000000ex 00	-.287000000000ex-01	.793472604047ex-05
690	.859000000000ex-05	.960000000000ex 00	-.133400000000ex 00	.606546913179ex-05
700	.105000000000ex-04	.960000000000ex 00	-.723200000000ex 00	.190660414173ex-05
710	.114000000000ex-04	.960000000000ex 00	-.165330000000ex 01	.243151013636ex-06
INTEGRAL .617818269336ex-03				

FILM TYPE : SO-022

FILTER : BB

STATION : 5

SHUTTER : Slow

D = 1.74

f = 5.6

FILM TYPE : SO-022

FILTER : BB

STATION : 5

SHUTTER : Medium

D = 1.75

f = 4.0

184

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
570	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
580	.103000000000ex-04	.000000000000ex 00	.637000000000ex-01	.000000000000ex 00
590	.106000000000ex-04	.100000000000ex 00	.338000000000ex-01	.114579221004ex-05
600	.108000000000ex-04	.600000000000ex 00	-.700000000000ex-02	.637639196533ex-05
610	.104000000000ex-04	.860000000000ex 00	-.485000000000ex-01	.799892805362ex-05
620	.990000000000ex-05	.940000000000ex 00	-.109700000000ex 00	.722874738482ex-05
630	.939000000000ex-05	.960000000000ex 00	-.133700000000ex 00	.662577715739ex-05
640	.906000000000ex-05	.970000000000ex 00	-.113300000000ex 00	.677017557957ex-05
650	.869000000000ex-05	.960000000000ex 00	-.109100000000ex 00	.648919775834ex-05
660	.854000000000ex-05	.960000000000ex 00	-.256000000000ex-01	.772910315787ex-05
670	.872000000000ex-05	.960000000000ex 00	.482000000000ex-01	.935379220860ex-05
680	.882000000000ex-05	.960000000000ex 00	.954000000000ex-01	.105472640376ex-04
690	.859000000000ex-05	.960000000000ex 00	-.122000000000ex-01	.801796944444ex-05
700	.105000000000ex-04	.960000000000ex 00	-.586100000000ex 00	.261433075580ex-05
710	.114000000000ex-04	.960000000000ex 00	-.144210000000ex 01	.395435890708ex-06
INTEGRAL .815741336916ex-03				

FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Fast

Med

Slow

D = 1.17

1.15

1.13

f = 3.5

4.7

6.3

185

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
590	.106000000000ex-04	.000000000000ex 00	.387400000000ex 00	.000000000000ex 00
600	.108000000000ex-04	.100000000000ex-01	.339200000000ex 00	.235843415380ex-06
610	.104000000000ex-04	.290000000000ex 00	.307200000000ex 00	.611830801838ex-05
620	.990000000000ex-05	.640000000000ex 00	.308500000000ex 00	.128918477689ex-04
630	.939000000000ex-05	.820000000000ex 00	.229200000000ex 00	.130520715131ex-04
640	.906000000000ex-05	.880000000000ex 00	.219500000000ex 00	.132163298712ex-04
650	.869000000000ex-05	.870000000000ex 00	.235600000000ex 00	.130058586308ex-04
660	.854000000000ex-05	.820000000000ex 00	.311600000000ex 00	.143506549754ex-04
670	.872000000000ex-05	.810000000000ex 00	.395800000000ex 00	.175712033088ex-04
680	.883000000000ex-05	.890000000000ex 00	.432900000000ex 00	.212936793621ex-04
690	.859000000000ex-05	.670000000000ex 00	.332100000000ex 00	.123642553750ex-04
700	.105000000000ex-04	.180000000000ex 00	.210800000000ex 00	.116321984862ex-05
710	.114000000000ex-04	.500000000000ex-01	.947800000000ex 00	.642798501518ex-07
INTEGRAL .125631324835ex-02				

FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Medium

D = 1.67

f = 3.5

FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Slow

D = 1.67

f = 4.7

981

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
590	.106000000000ex-04	.000000000000ex 00	.148400000000ex 00	.000000000000ex 00
600	.108000000000ex-04	.100000000000ex-01	.106800000000ex 00	.138109564397ex-06
610	.104000000000ex-04	.290000000000ex 00	.702000000000ex-01	.354512323941ex-05
620	.990000000000ex-05	.640000000000ex 00	-.540000000000ex-02	.625770619233ex-05
630	.939000000000ex-05	.820000000000ex 00	-.273000000000ex-01	.723068504085ex-05
640	.906000000000ex-05	.880000000000ex 00	-.470000000000ex-02	.788698236620ex-05
650	.869000000000ex-05	.870000000000ex 00	.260000000000ex-02	.760569716307ex-05
660	.854000000000ex-05	.820000000000ex 00	.905000000000ex-01	.862525062094ex-05
670	.872000000000ex-05	.810000000000ex 00	.166100000000ex 00	.103538412958ex-04
680	.883000000000ex-05	.890000000000ex 00	.207900000000ex 00	.126838386924ex-04
690	.859000000000ex-05	.670000000000ex 00	.102200000000ex 00	.728228994695ex-05
700	.105000000000ex-04	.180000000000ex 00	-.458100000000ex 00	.658205950445ex-06
710	.114000000000ex-04	.500000000000ex-01	-.127870000000ex 01	.300037028510ex-07
INTEGRAL .723552168726ex-03				

FIILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Slow

D = 2.15

f = 3.5

187

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
590	.106000000000ex-04	.000000000000ex 00-	.919000000000ex-01	.000000000000ex 00
600	.108000000000ex-04	.100000000000ex-01-	.133300000000ex 00	.794554616798ex-07
610	.104000000000ex-04	.290000000000ex 00-	.175000000000ex 00	.201572525539ex-05
620	.990000000000ex-05	.640000000000ex 00-	.208400000000ex 00	.392116546114ex-05
630	.939000000000ex-05	.820000000000ex 00-	.241800000000ex 00	.441244641824ex-05
640	.906000000000ex-05	.880000000000ex 00-	.229800000000ex 00	.469689519761ex-05
650	.869000000000ex-05	.870000000000ex 00-	.228800000000ex 00	.446415257135ex-05
660	.854000000000ex-05	.820000000000ex 00-	.153800000000ex 00	.491441381393ex-05
670	.872000000000ex-05	.810000000000ex 00-	.801000000000ex-01	.587356127486ex-05
680	.883000000000ex-05	.890000000000ex 00-	.287000000000ex-01	.735615226669ex-05
690	.859000000000ex-05	.670000000000ex 00-	.133400000000ex 00	.423319199823ex-05
700	.105000000000ex-04	.180000000000ex 00-	.723200000000ex 00	.357488276574ex-06
710	.114000000000ex-04	.500000000000ex-01-	.165330000000ex.01	.126641152935ex-07
INTEGRAL	.000000000000ex 00	.424377003533ex-03		

FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Fast

D = 0.37

f = 6.3

181

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
590	.106000000000ex-04	.000000000000ex 00	.108730000000ex 01	.000000000000ex 00
600	.108000000000ex-04	.100000000000ex-01	.106260000000ex 01	.124745174677ex-05
610	.104000000000ex-04	.290000000000ex 00	.102890000000ex 01	.322352718571ex-04
620	.990000000000ex-05	.640000000000ex 00	.987400000000ex 00	.615481733894ex-04
630	.939000000000ex-05	.820000000000ex 00	.939400000000ex 00	.669698682656ex-04
640	.906000000000ex-05	.880000000000ex 00	.886300000000ex 00	.613636055831ex-04
650	.869000000000ex-05	.870000000000ex 00	.868300000000ex 00	.558263236523ex-04
660	.854000000000ex-05	.820000000000ex 00	.101210000000ex 01	.720065035265ex-04
670	.872000000000ex-05	.810000000000ex 00	.113930000000ex 01	.973422776510ex-04
680	.883000000000ex-05	.890000000000ex 00	.112480000000ex 01	.104749198891ex-03
690	.859000000000ex-05	.670000000000ex 00	.104460000000ex 01	.637775697706ex-04
700	.105000000000ex-04	.180000000000ex 00	.455600000000ex 00	.539587405394ex-05
710	.114000000000ex-04	.500000000000ex-01	.158000000000ex 00	.396163861024ex-06
720	.129000000000ex-04	.200000000000ex-01	.786900000000ex 00	.421424427944ex-07
730	.151000000000ex-04	.100000000000ex-01	.138030000000ex 01	.629038094804ex-08
INTEGRAL .619504346336ex-02				



FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Fast

D = 0.68

f = 4.7

FILM TYPE : SO-022

FILTER : JJ

STATION : 5

SHUTTER : Medium

D = 0.67

f = 6.3

189

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
580	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
590	.106000000000ex-04	.000000000000ex 00	.831400000000ex 00	.000000000000ex 00
600	.108000000000ex-04	.100000000000ex-01	.756000000000ex 00	.615777414063ex-06
610	.104000000000ex-04	.290000000000ex 00	.726000000000ex 00	.160483850994ex-04
620	.990000000000ex-05	.640000000000ex 00	.699200000000ex 00	.316967816829ex-04
630	.939000000000ex-05	.820000000000ex 00	.653300000000ex 00	.346560805729ex-04
640	.906000000000ex-05	.880000000000ex 00	.658100000000ex 00	.362836417151ex-04
650	.869000000000ex-05	.870000000000ex 00	.651400000000ex 00	.338796588889ex-04
660	.854000000000ex-05	.820000000000ex 00	.738400000000ex 00	.383417316317ex-04
670	.872000000000ex-05	.810000000000ex 00	.802900000000ex 00	.448643627878ex-04
680	.883000000000ex-05	.890000000000ex 00	.859000000000ex 00	.568003105556ex-04
690	.859000000000ex-05	.670000000000ex 00	.763000000000ex 00	.333478597654ex-04
700	.105000000000ex-04	.180000000000ex 00	.220600000000ex 00	.314095564947ex-05
710	.114000000000ex-04	.500000000000ex-01	.383500000000ex 04	.000000000000ex 00
720	.129000000000ex-04	.200000000000ex-01	.122970000000ex 01	.152026643103ex-07
INTEGRAL	.328319662805ex-02			

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Slow

D = 2.24

f = 3.5

190

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	-.225900000000ex 00	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	-.281300000000ex 00	.420160813502ex-07
490	.853000000000ex-05	.230000000000ex 00	-.343300000000ex 00	.889973073702ex-06
500	.878000000000ex-05	.600000000000ex 00	-.354400000000ex 00	.232940909221ex-05
510	.907000000000ex-05	.760000000000ex 00	-.302000000000ex 00	.343891054894ex-05
520	.922000000000ex-05	.840000000000ex 00	-.268800000000ex 00	.417071205332ex-05
530	.944000000000ex-05	.890000000000ex 00	-.239900000000ex 00	.483572951720ex-05
540	.974000000000ex-05	.920000000000ex 00	-.190400000000ex 00	.578025215410ex-05
550	.989000000000ex-05	.910000000000ex 00	-.148700000000ex 00	.639054185945ex-05
560	.100000000000ex-04	.890000000000ex 00	-.122100000000ex 00	.671877359331ex-05
570	.101000000000ex-04	.880000000000ex 00	-.691000000000ex-01	.758060811290ex-05
580	.103000000000ex-04	.890000000000ex 00	-.588000000000ex-01	.800621468329ex-05
590	.106000000000ex-04	.720000000000ex 00	-.919000000000ex-01	.617644191712ex-05
600	.108000000000ex-04	.220000000000ex 00	-.133300000000ex 00	.174802015695ex-05
610	.104000000000ex-04	.500000000000ex-01	-.175000000000ex 00	.347538837136ex-06
620	.990000000000ex-05	.200000000000ex-01	-.208400000000ex 00	.122536420660ex-06
630	.939000000000ex-05	.100000000000ex-01	-.241800000000ex 00	.538103221736ex-07
640	.906000000000ex-05	.000000000000ex 00	-.229800000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .583662817713ex-03				

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Medium

D = 1.81

f = 3.5

161

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	-.923000000000ex-01	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	-.152600000000ex 00	.565087297891ex-07
490	.853000000000ex-05	.230000000000ex 00	-.218300000000ex 00	.118679816782ex-05
500	.878000000000ex-05	.600000000000ex 00	-.220900000000ex 00	.316771255785ex-05
510	.907000000000ex-05	.760000000000ex 00	-.173500000000ex 00	.462296791550ex-05
520	.922000000000ex-05	.840000000000ex 00	-.142200000000ex 00	.558226188616ex-05
530	.944000000000ex-05	.890000000000ex 00	-.116100000000ex 00	.643075554596ex-05
540	.974000000000ex-05	.920000000000ex 00	-.568000000000ex-01	.786224882391ex-05
550	.989000000000ex-05	.910000000000ex 00	-.208000000000ex-01	.857902007174ex-05
560	.100000000000ex-04	.890000000000ex 00	.760000000000ex-02	.905711759731ex-05
570	.101000000000ex-04	.880000000000ex 00	.574000000000ex-01	.101438786681ex-04
580	.103000000000ex-04	.890000000000ex 00	.637000000000ex-01	.106151767863ex-04
590	.106000000000ex-04	.720000000000ex 00	.338000000000ex-01	.824970391230ex-05
600	.108000000000ex-04	.220000000000ex 00	-.700000000000ex-02	.233801038728ex-05
610	.104000000000ex-04	.500000000000ex-01	-.485000000000ex-01	.465053956606ex-06
620	.990000000000ex-05	.200000000000ex-01	-.109700000000ex 00	.153803135847ex-06
630	.939000000000ex-05	.100000000000ex-01	-.133700000000ex 00	.690185120561ex-07
640	.906000000000ex-05	.000000000000ex 00	-.113300000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00

INTEGRAL .782752510383ex-03

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Slow

D = 1.78

f = 4.7

192

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00-	.923000000000ex-01	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01-	.152600000000ex 00	.565087297891ex-07
490	.853000000000ex-05	.230000000000ex 00-	.218600000000ex 00	.118597863978ex-05
500	.878000000000ex-05	.600000000000ex 00-	.220900000000ex 00	.316771255785ex-05
510	.907000000000ex 00	.760000000000ex-05-	.173500000000ex 00	.462296791550ex-05
520	.922000000000ex-05	.840000000000ex 00-	.142200000000ex 00	.558226188616ex-05
530	.944000000000ex-05	.890000000000ex 00-	.116100000000ex 00	.643075554596ex-05
540	.974000000000ex-05	.920000000000ex 00-	.568000000000ex-01	.786224882391ex-05
550	.989000000000ex-05	.910000000000ex 00-	.208000000000ex-01	.857902007174ex-05
560	.100000000000ex-04	.890000000000ex 00	.760000000000ex-02	.905711759731ex-05
570	.101000000000ex-04	.880000000000ex 00	.574000000000ex-01	.101438786681ex-04
580	.103000000000ex-04	.890000000000ex 00	.637000000000ex-01	.106151767863ex-04
590	.106000000000ex-04	.720000000000ex 00	.338000000000ex-01	.824970391230ex-05
600	.108000000000ex-04	.220000000000ex 00-	.700000000000ex-02	.233801038728ex-05
610	.104000000000ex-04	.500000000000ex-01-	.458000000000ex-01	.467954193651ex-06
620	.990000000000ex-05	.200000000000ex-01-	.109700000000ex 00	.153803135847ex-06
630	.939000000000ex-05	.100000000000ex-01-	.133700000000ex 00	.690185120561ex-07
640	.906000000000ex-05	.000000000000ex 00-	.113300000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .782766381776ex-03				

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Fast

D= 0.46

f= 6.7

193

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	.113750000000ex 01	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	.930900000000ex 00	.684881673565ex-06
490	.853000000000ex-05	.230000000000ex 00	.861500000000ex 00	.142618829301ex-04
500	.878000000000ex-05	.600000000000ex 00	.819100000000ex 00	.347332775134ex-04
510	.907000000000ex-05	.760000000000ex 00	.824700000000ex 00	.460384696909ex-04
520	.922000000000ex-05	.840000000000ex 00	.893900000000ex 00	.606610896326ex-04
530	.944000000000ex-05	.890000000000ex 00	.968600000000ex 00	.781559418224ex-04
540	.974000000000ex-05	.920000000000ex 00	.102680000000ex 01	.953118247517ex-04
550	.989000000000ex-05	.910000000000ex 00	.106780000000ex 01	.105205315696ex-03
560	.100000000000ex-04	.890000000000ex 00	.109310000000ex 01	.110278285791ex-03
570	.101000000000ex-04	.880000000000ex 00	.108250000000ex 01	.107474156659ex-03
580	.103000000000ex-04	.890000000000ex 00	.109310000000ex 01	.113586634365ex-03
590	.106000000000ex-04	.720000000000ex 00	.108730000000ex 01	.933121855801ex-04
600	.108000000000ex-04	.220000000000ex 00	.106260000000ex 01	.274439384290ex-04
610	.104000000000ex-04	.500000000000ex-01	.102890000000ex 01	.555780549261ex-05
620	.990000000000ex-05	.200000000000ex-01	.987400000000ex 00	.192338041842ex-05
630	.939000000000ex-05	.100000000000ex-01	.939400000000ex 00	.816705710556ex-06
640	.906000000000ex-05	.000000000000ex 00	.886300000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .893379392473ex-02				

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Slow

D = 1.25

f = 6.7

FILM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Fast

D = 1.30

f = 3.5

194

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	.296500000000ex 00	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	.231800000000ex 00	.136935340259ex-06
490	.853000000000ex-05	.230000000000ex 00	.135000000000ex 00	.267717565567ex-05
500	.878000000000ex-05	.600000000000ex 00	.139600000000ex 00	.726516975479ex-05
510	.907000000000ex-05	.760000000000ex 00	.177100000000ex 00	.103638442892ex-04
520	.922000000000ex-05	.840000000000ex 00	.208100000000ex 00	.125057633778ex-04
530	.944000000000ex-05	.890000000000ex 00	.255300000000ex 00	.151238374498ex-04
540	.974000000000ex-05	.920000000000ex 00	.306700000000ex 00	.181571124910ex-04
550	.989000000000ex-05	.910000000000ex 00	.330800000000ex 00	.192769217260ex-04
560	.100000000000ex-04	.890000000000ex 00	.369800000000ex 00	.208540306086ex-04
570	.101000000000ex-04	.880000000000ex 00	.404100000000ex 00	.225374121013ex-04
580	.103000000000ex-04	.890000000000ex 00	.417700000000ex 00	.239843101382ex-04
590	.106000000000ex-04	.720000000000ex 00	.387400000000ex 00	.186225162407ex-04
600	.108000000000ex-04	.220000000000ex 00	.339200000000ex 00	.518855513837ex-05
610	.104000000000ex-04	.500000000000ex-01	.307500000000ex 00	.105560963032ex-05
620	.990000000000ex-04	.200000000000ex-01	.308500000000ex 00	.402870242778ex-05
630	.939000000000ex-05	.100000000000ex-01	.229200000000ex 00	.159171603818ex-06
640	.906000000000ex-05	.000000000000ex 00	.219500000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL	.182705098165ex-02			

FILM TYPE : SO-022  
FILTER : AA  
STATION : 6  
SHUTTER : Medium

D = 0.77  
f = 6.7

FILM TYPE : SO-022  
FILTER : AA  
STATION : 6  
SHUTTER : Fast

D = 0.80  
f = 4.7

195

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	.592500000000ex 00	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	.522000000000ex 00	.267125621295ex-06
490	.853000000000ex-05	.230000000000ex 00	.423600000000ex 00	.520327605004ex-05
500	.878000000000ex-05	.600000000000ex 00	.408200000000ex 00	.134848390204ex-04
510	.907000000000ex-05	.760000000000ex 00	.445300000000ex 00	.192185615673ex-04
520	.922000000000ex-05	.840000000000ex 00	.487300000000ex 00	.237853861848ex-04
530	.944000000000ex-05	.890000000000ex 00	.528200000000ex 00	.283505834446ex-04
540	.974000000000ex-05	.920000000000ex 00	.586000000000ex 00	.345419446737ex-04
550	.989000000000ex-05	.910000000000ex 00	.613400000000ex 00	.369519774252ex-04
560	.100000000000ex-04	.890000000000ex 00	.637800000000ex 00	.386536052088ex-04
570	.101000000000ex-04	.880000000000ex 00	.664600000000ex 00	.410585914013ex-04
580	.103000000000ex-04	.890000000000ex 00	.683900000000ex 00	.442718052494ex-04
590	.106000000000ex-04	.720000000000ex 00	.654700000000ex 00	.344618320604ex-04
600	.108000000000ex-04	.220000000000ex 00	.606300000000ex 00	.959724178743ex-05
610	.104000000000ex-04	.500000000000ex-01	.575500000000ex 00	.195660583179ex-05
620	.990000000000ex-05	.200000000000ex-01	.551600000000ex 00	.705123502267ex-06
630	.939000000000ex-05	.100000000000ex-01	.499600000000ex 00	.296664508310ex-06
640	.906000000000ex-05	.000000000000ex 00	.490600000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .332074823188ex-02				

FIIM TYPE : SO-022

FILTER : AA

STATION : 6

SHUTTER : Medium

D = 1.27

f = 4.7

961

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
470	.746000000000ex-05	.000000000000ex 00	.296500000000ex 00	.000000000000ex 00
480	.803000000000ex-05	.100000000000ex-01	.231800000000ex 00	.136935340259ex-06
490	.853000000000ex-05	.230000000000ex 00	.135000000000ex 00	.267717565567ex-05
500	.878000000000ex-05	.600000000000ex 00	.139600000000ex 00	.726516975479ex-05
510	.907000000000ex-05	.760000000000ex 00	.177100000000ex 00	.103638442892ex-04
520	.922000000000ex-05	.840000000000ex 00	.208100000000ex 00	.125057633778ex-04
530	.944000000000ex-05	.890000000000ex 00	.255300000000ex 00	.151238374498ex-04
540	.974000000000ex-05	.920000000000ex 00	.306700000000ex 00	.181571124910ex-04
550	.989000000000ex-05	.910000000000ex 00	.330800000000ex 00	.192769217260ex-04
560	.100000000000ex-04	.890000000000ex 00	.369800000000ex 00	.208540306086ex-04
570	.101000000000ex-04	.880000000000ex 00	.404100000000ex 00	.225374121013ex-04
580	.103000000000ex-04	.890000000000ex 00	.417700000000ex 00	.239843101382ex-04
590	.106000000000ex-04	.720000000000ex 00	.387400000000ex 00	.186225162407ex-04
600	.108000000000ex-04	.220000000000ex 00	.339200000000ex 00	.518855513837ex-05
610	.104000000000ex-04	.500000000000ex-01	.307500000000ex 00	.105560963032ex-05
620	.990000000000ex-05	.200000000000ex-01	.308500000000ex 00	.402870242778ex-06
630	.939000000000ex-05	.100000000000ex-01	.229200000000ex 00	.159171603818ex-06
640	.906000000000ex-05	.000000000000ex 00	.219500000000ex 00	.000000000000ex 00
650	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL	.177870655252ex-02			



FILM TYPE : SO-022  
 FILTER : GG + MM  
 STATION : 6  
 SHUTTER : Medium Fast  
 D = 0.70 0.71  
 F = 5.6 4.0

197

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.452400000000ex 00	.960400000000ex 00	.512087625615ex-05
410	.247000000000ex-05	.553000000000ex 00	.906700000000ex 00	.110184900689ex-04
420	.364000000000ex-05	.615600000000ex 00	.895200000000ex 00	.176035393257ex-04
430	.455000000000ex-05	.647400000000ex 00	.890700000000ex 00	.229025632773ex-04
440	.532000000000ex-05	.705500000000ex 00	.857800000000ex 00	.270525775317ex-04
450	.675000000000ex-05	.748200000000ex 00	.782500000000ex 00	.306070502603ex-04
460	.685000000000ex-05	.774300000000ex 00	.688000000000ex 00	.258582917272ex-04
470	.746000000000ex-05	.682500000000ex 00	.592500000000ex 00	.199223920921ex-04
480	.803000000000ex-05	.783200000000ex 00	.522000000000ex 00	.209212786598ex-04
490	.853000000000ex-05	.623000000000ex 00	.423600000000ex 00	.140940912138ex-04
500	.878000000000ex-05	.231400000000ex 00	.408200000000ex 00	.520065291553ex-05
510	.907000000000ex-05	.442500000000ex 00	.445300000000ex 00	.111897545968ex-04
520	.922000000000ex-05	.880000000000ex 00	.487300000000ex 00	.249180236222ex-04
530	.944000000000ex-05	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
540	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL	.229055656618ex-02			

FILM TYPE : SO-022  
 FILTER : GG + MM  
 STATION : 6  
 SHUTTER : Slow Medium  
 D = 1.13 1.15  
 f = 5.6 4.0

198

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.452400000000ex 00	.637300000000ex 00	.243357245696ex-05
410	.247000000000ex-05	.553000000000ex 00	.568400000000ex 00	.505617485564ex-05
420	.364000000000ex-05	.615600000000ex 00	.555200000000ex 00	.804636992120ex-05
430	.455000000000ex-05	.647400000000ex 00	.577900000000ex 00	.111451031349ex-04
440	.532000000000ex-05	.705500000000ex 00	.547300000000ex 00	.132345338897ex-04
450	.657000000000ex-05	.748200000000ex 00	.491200000000ex 00	.152329169187ex-04
460	.685000000000ex-05	.774300000000ex 00	.400100000000ex 00	.133260006696ex-04
470	.746000000000ex-05	.682500000000ex 00	.296500000000ex 00	.100772372462ex-04
480	.803000000000ex-05	.783200000000ex 00	.231800000000ex 00	.107247758491ex-04
490	.853000000000ex-05	.623000000000ex 00	.135000000000ex 00	.725165405863ex-05
500	.878000000000ex-05	.231400000000ex 00	.139600000000ex 00	.280193380210ex-05
510	.907000000000ex-05	.442500000000ex 00	.177100000000ex 00	.603421197105ex-05
520	.922000000000ex-05	.880000000000ex 00	.208100000000ex 00	.131012759196ex-04
530	.944000000000ex-05	.000000000000ex 00	.255300000000ex 00	.000000000000ex 00
540	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .114697515098ex-02				

FILM TYPE : SO-022  
 FILTER : GG + MM  
 STATION : 6  
 SHUTTER : Fast  
 D = 0.42  
 f = 5.6

199

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.452400000000ex 00	.149600000000ex 01	.175769809248ex-04
410	.247000000000ex-05	.553000000000ex 00	.145900000000ex 01	.393026726866ex-04
420	.364000000000ex-05	.615600000000ex 00	.144750000000ex 01	.627913752174ex-04
430	.455000000000ex-05	.647400000000ex 00	.144840000000ex 01	.827149652686ex-04
440	.532000000000ex-05	.705500000000ex 00	.141540000000ex 01	.976806746279ex-04
450	.657000000000ex-05	.748200000000ex 00	.136310000000ex 01	.113418284320ex-03
460	.685000000000ex-05	.774300000000ex 00	.130640000000ex 01	.107398899380ex-03
470	.746000000000ex-05	.682500000000ex 00	.113750000000ex 01	.698781635993ex-04
480	.803000000000ex-05	.783200000000ex 00	.930900000000ex 00	.536399326736ex-04
490	.853000000000ex-05	.623000000000ex 00	.861500000000ex 00	.386311002847ex-04
500	.878000000000ex-05	.231400000000ex 00	.819100000000ex 00	.133954673610ex-04
510	.907000000000ex-05	.442500000000ex 00	.824700000000ex 00	.268052932082ex-04
520	.922000000000ex-05	.880000000000ex 00	.893900000000ex 00	.635497129484ex-04
530	.944000000000ex-05	.000000000000ex 00	.968600000000ex 00	.000000000000ex 00
540	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .765830340923ex-02				

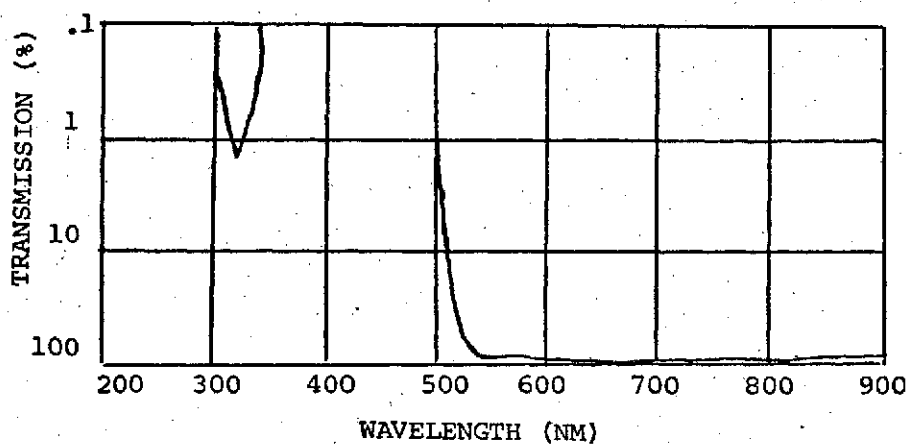
FILM TYPE: SO-022  
 FILTER : GG + MM  
 STATION : 6  
 SHUTTER : Slow  
 D = 1.63  
 f = 4.0

200

WL	RADIANCE	FILTER FACTOR	LOG SPECT.SENSI.	PRODUCT
400	.124000000000ex-05	.452400000000ex 00	.376400000000ex 00	.133457898340ex-05
410	.247000000000ex-05	.553000000000ex 00	.319400000000ex 00	.284985054308ex-05
420	.364000000000ex-05	.615600000000ex 00	.302500000000ex 00	.449676295801ex-05
430	.455000000000ex-05	.647400000000ex 00	.319000000000ex 00	.614022225962ex-05
440	.532000000000ex-05	.705500000000ex 00	.301700000000ex 00	.751810956120ex-05
450	.685000000000ex-05	.774300000000ex 00	.164700000000ex 00	.774996659861ex-05
460	.685000000000ex-05	.774300000000ex 00	.164700000000ex 00	.774996659861ex-05
470	.746000000000ex-05	.682500000000ex 00	.366000000000ex 00	.118260982618ex-04
480	.803000000000ex-05	.783200000000ex 00	.291000000000ex 00	.122910284539ex-04
490	.853000000000ex-05	.623000000000ex 00	.102800000000ex 00	.419408355063ex-05
500	.878000000000ex-05	.231400000000ex 00	.980000000000ex 00	.212744269404ex-06
510	.907000000000ex-05	.442500000000ex 00	.544000000000ex 00	.140449617923ex-04
520	.922000000000ex-05	.880000000000ex 00	.244000000000ex 00	.462608483957ex-05
530	.944000000000ex-05	.000000000000ex 00	.540000000000ex 00	.000000000000ex 00
540	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00	.000000000000ex 00
INTEGRAL .874482347886ex-03				

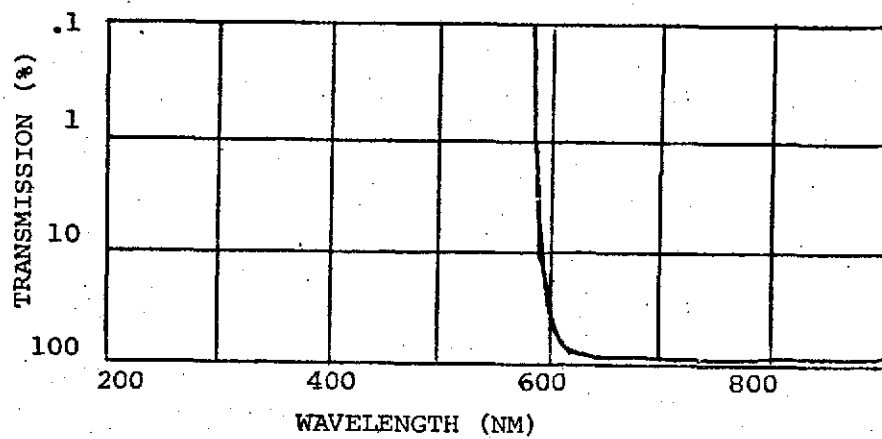
APPENDIX D

FILTER CURVES



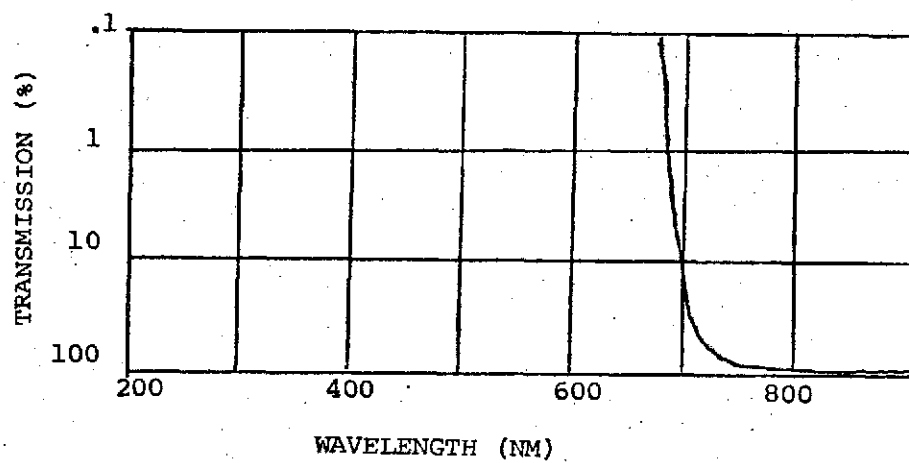
WRATTEN 12 FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
490	0
500	1.5
510	17.3
520	55.0
530	77.8
540	86.0
550	88.4
560	89.4
570	89.7
580	90.1
590	90.3
600	90.4
610	90.5
620	90.7
630	90.8
640	90.9
650	91.0
660	91.1
670	91.2
680	91.2
690	91.2
700	91.3



WRATTEN 25 FILTER

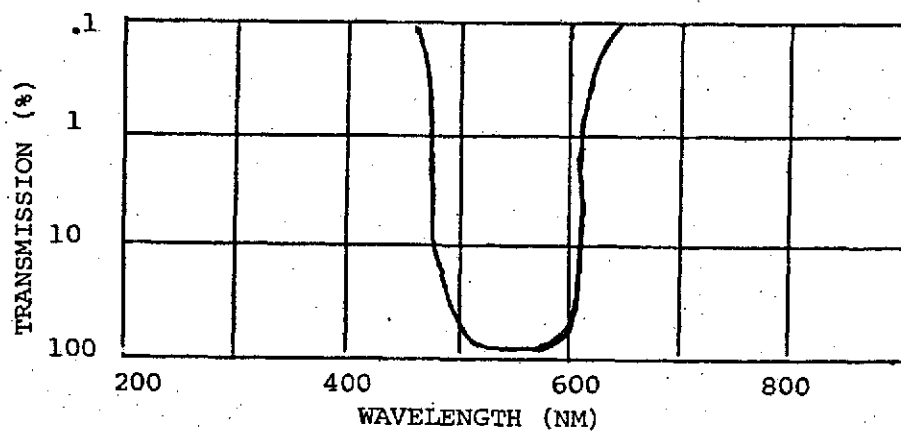
<u>Wavelength</u>	<u>Percent Transmittance</u>
580	0
590	12.6
600	50.0
610	75.0
620	82.6
630	85.5
640	86.7
650	87.6
660	88.2
670	88.5
680	89.0
690	89.3
700	89.5



### 89B FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
670	0
680	0.10
690	1.58
700	11.2
710	32.4
720	57.6
730	69.1
740	77.6
750	83.1
760	85.0
770	86.1
780	87.0
790	87.7
800	88.1
810	88.4
820	88.6
830	88.8
840	89.0
850	89.2
860	89.4
870	89.6
880	89.8
890	89.9
900	90.0
910	90.1
920	90.2
930	90.3
940	90.4
950	90.5



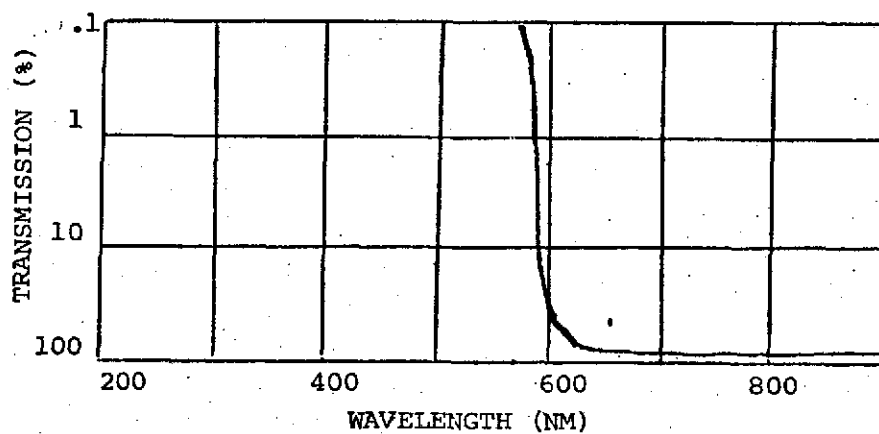


# AA FILTER

## Wavelength

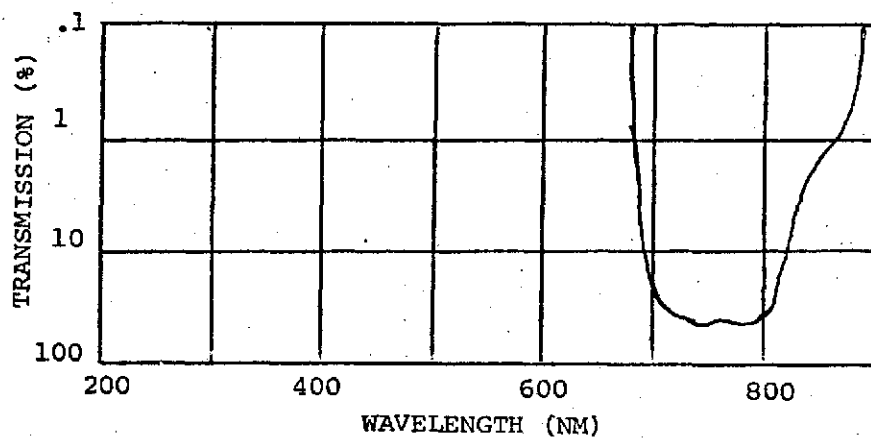
## Percent Transmittance

470	0
480	1
490	23
500	60
510	76
520	84
530	89
540	92
550	91
560	89
570	88
580	89
590	72
600	22
610	5
620	2
630	1
640	0



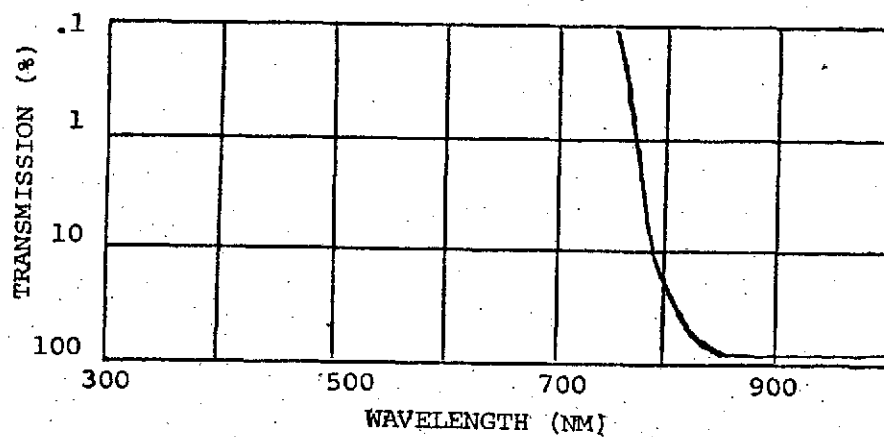
BB FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
580	0
590	10
600	60
610	86
620	94
630	96
640	97
650	96
660	96
670	96
680	96
690	96
700	96
710	96
720	96
730	96



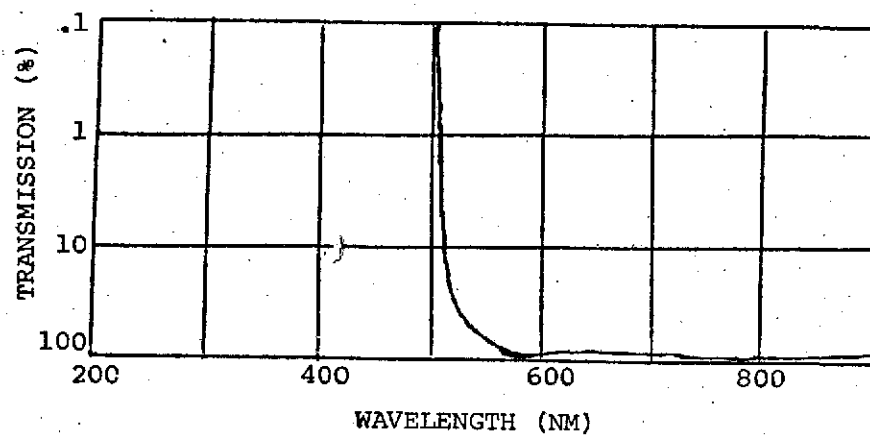
CC FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
680	0
690	2
700	25
710	59
720	78
730	87
740	89
750	88
760	84
770	82
780	85
790	91
800	89
810	59
820	23
830	9
840	4
850	2
860	1
870	0
880	0



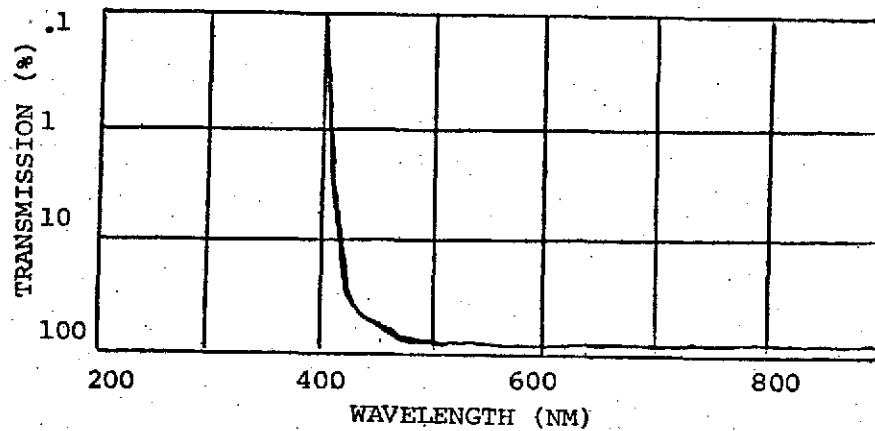
DD Filter

<u>Wavelength</u>	<u>Percent Transmittance</u>
750	0
760	1
770	2
780	5
790	13
800	31
810	53
820	72
830	84
840	91
850	94
860	95
870	96
880	96
890	96
900	95
910	95
920	95



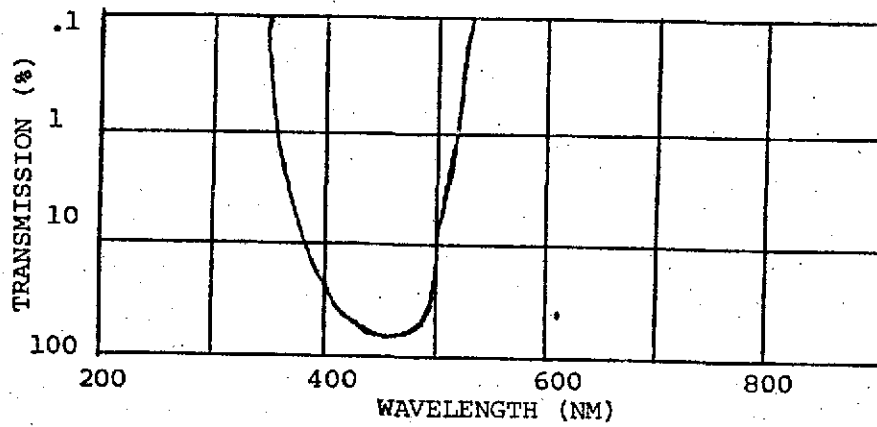
EE FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
500	0
510	10
520	52
530	78
540	89
550	93
560	95
570	95.5
580	96
590	96.5
600	96.5



FF FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
400	0
410	3
420	31
430	64
440	78
450	85
460	89
470	91
480	93
490	94
500	95
510	94.5
520	94.5
530	94.5
540	95
550	95.5
560	96.5
570	96
580	95.5
590	94.5
600	94
610	94
620	94



GG FILTER

<u>Wavelength</u>	<u>Percent Transmittance</u>
360	0
370	1
380	13
390	36
400	58
410	70
420	76
430	78
440	83
450	87
460	89
470	78
480	89
490	70
500	26
510	5
520	1
530	0